

SAN FRANCISCO
COMMUNITY RENEWAL PROGRAM
PHASE I: RESEARCH DESIGN

TECHNICAL REPORTS

to
The Department of City Planning
of
The City and County of San Francisco

- Technical Memorandum #1 - Data Reconnaissance Program
- Technical Memorandum #2 - Community Renewal Programming Model
- Technical Memorandum #3 - Research Program

July 18, 1963

C-65400

Arthur D. Little, Inc.

THE
OFFICE OF THE
SECRETARY OF THE
NAVY
WASHINGTON, D. C.
JANUARY 1, 1901

TO THE
HONORABLE SECRETARY OF THE
NAVY
WASHINGTON, D. C.

DEAR SIR:

Yours
Very truly,
J. D. [Signature]

HT 177
S3
2524
1963
ENVI

July 18, 1963

Mr. James R. McCarthy
Director of Planning
Department of City Planning
City and County of San Francisco
100 Larkin Street
San Francisco 2, California

Dear Mr. McCarthy:

In our Interim Report, dated June 18, 1963, we discussed the nature of San Francisco's Community Renewal Program and the progress that had occurred during Phase I of the Program. We indicated in the report that, to complete the work on Phase I - the overall Research Design stage - we would submit three technical memoranda, dealing with the Data Reconnaissance Program, the Preliminary Model, and Research Program for the next stages of the Community Renewal Program.

These memoranda, which we are pleased to submit with this letter, are intended for those involved in the technical aspects of the Program - our own staff, the staffs of the Department of City Planning, and other participating city agencies, and the Technical Advisory Committee. Together with our Interim Report and the Data Abstracts, these memoranda constitute our report on and mark the completion of our work in connection with Phase I of the Program.

It is our hope that these technical memoranda will stimulate discussion among those interested in the technical aspects of the Program, for only through a mutual exchange of ideas can we successfully carry out the challenging research program before us.

Yours very truly,

Ira M. Robinson

Ira M. Robinson

IRM/byr

enclosures

The preparation of Technical Memoranda
Numbers 1, 2, and 3 was financed in
part through a Community Renewal Program
Grant from the United States Housing and
Home Finance Agency under provisions of
Section 405 of the Housing Act of 1959.

July 18, 1963

City and County of San Francisco

Department of City Planning

Contract No. Calif. R-69-(CR) (G)

The preparation of Technical Memoranda
Numbers 1, 2, and 3 was financed in
part through a Community Research Program
Grant from the United States Housing and
Home Finance Agency under provisions of
Section 402 of the Housing Act of 1952.

July 18, 1953

City and County of San Francisco

Department of City Planning

Contract No. Calif. R-52-(CR) (6)

TABLE OF CONTENTS

	<u>Page</u>
 <u>Technical Memorandum #1 - Data Reconnaissance Program</u>	
Field Survey Procedure	2
General Characteristics of Existing Data	3
Data Abstracts	4
Classification System	4
CRP Library - An Information Retrieval System	7
Highlights of Information	8
Participating Agencies	20
Appendices	(following)22
 <u>Technical Memorandum #2 - Community Renewal Programming Model</u>	
The Systems Concept	2
Objectives to be Considered	3
History	4
The San Francisco Community Renewal Programming Model	7
Definition of Main Storage Elements	11
Operation of the Model	14
Output of the Model	22
 <u>Technical Memorandum #3 - Research Program</u>	
Identification of Key Relationships and Development of Appropriate Methods for Operation of the Model	
Establishment of the Relevant Units, Components and Categories	3
Development of a Method for Forecasting the Number of User Units . .	8
Clarification of "Space Pressure" Concept and Development of Methods for Forecasting Its Components	9
Development of a Screening Process for Forecasting Market- Initiated Changes in the Space Use System	10
Development of a Method for Forecasting Non-Market-Initiated "Natural" Changes in Stock of Space	16

TABLE OF CONTENTS

Technical Appendix I - Data Requirements

1	General Information
2	Classification System
3	Classification System - An Alternative System
4	Classification System - An Alternative System
5	Classification System - An Alternative System
6	Classification System - An Alternative System
7	Classification System - An Alternative System
8	Classification System - An Alternative System
9	Classification System - An Alternative System
10	Classification System - An Alternative System

Technical Appendix II - Sample Data

1	General Information
2	Classification System
3	Classification System - An Alternative System
4	Classification System - An Alternative System
5	Classification System - An Alternative System
6	Classification System - An Alternative System
7	Classification System - An Alternative System
8	Classification System - An Alternative System
9	Classification System - An Alternative System
10	Classification System - An Alternative System

Technical Appendix III - Sample Data

1	General Information
2	Classification System
3	Classification System - An Alternative System
4	Classification System - An Alternative System
5	Classification System - An Alternative System
6	Classification System - An Alternative System
7	Classification System - An Alternative System
8	Classification System - An Alternative System
9	Classification System - An Alternative System
10	Classification System - An Alternative System

TABLE OF CONTENTS (cont.)Page

Development of a Method(s) for Forecasting Changes in the Space-Use System Due to Direct Public Actions	17
--	----

Basic Studies, Field Surveys and Data Collection Tasks

Space: Supply, Use, Development and Characteristics	19
Users: Their Needs, Resources and Changing Demands for Space	20
Private Developers and Investors	22
Public Policies, Programs, and Actions	23

Digitized by the Internet Archive
in 2026 with funding from
State of California and California State Library

WALLS OF EGYPT

1900

1901

1902

1903

1904

1905

Investigation of a few walls, the most interesting being the wall of the temple of Amenhotep III.

First expedition: the walls of Amenhotep III and Amenhotep IV.

Second expedition: the walls of Amenhotep III and Amenhotep IV.

Third expedition: the walls of Amenhotep III and Amenhotep IV.

Fourth expedition: the walls of Amenhotep III and Amenhotep IV.

Fifth expedition: the walls of Amenhotep III and Amenhotep IV.

Technical Memorandum #1THE DATA RECONNAISSANCE PROGRAM

One of the earliest tasks in preparing the Community Renewal Program was to develop a Data Reconnaissance Program to satisfy its information requirements. The investigations to be carried out over the 26-month period embody an examination of the land development process of the City of a magnitude not previously attempted. To design an accurate presentation of the complex activity of the City's land market, it is essential that the entire information sources of the community be marshalled to assist in the task. The purpose of the Data Reconnaissance Program was to locate relevant information; no information was actually collected during this stage of the program.

The Data Reconnaissance Program to date has resulted in the identification of existing information which is being systematically collected by public and private agencies and which bears on some aspect of land development in San Francisco. The information will serve as a source of data for the Community Renewal Programming Model. (See Technical Memorandum #2.) Collection of information during Phases II and III will be programmed on the basis of data sources identified during the reconnaissance program.

The discussion in the following pages describes the Data Reconnaissance Program including: (1) the field survey procedure used to locate data; (2) the general characteristics of the data that were uncovered during the reconnaissance; (3) the Data Abstracts prepared for distribution to all participating agencies; (4) the classification and information retrieval system developed to relate the available information to the data requirements of the model; (5) highlights of the information located; and (6) agencies and departments involved in the Data Reconnaissance Program.

THE LATE REPUBLICAN PERIOD

THE LATE REPUBLICAN PERIOD

One of the chief aims of the late republican period was to bring about a more efficient and economical government. The late republican period was characterized by a number of reforms which were designed to improve the efficiency of the government. These reforms included the establishment of a civil service, the creation of a public health service, and the establishment of a system of public education. The late republican period was also characterized by a number of reforms which were designed to improve the efficiency of the government. These reforms included the establishment of a civil service, the creation of a public health service, and the establishment of a system of public education.

The late republican period was also characterized by a number of reforms which were designed to improve the efficiency of the government. These reforms included the establishment of a civil service, the creation of a public health service, and the establishment of a system of public education. The late republican period was also characterized by a number of reforms which were designed to improve the efficiency of the government. These reforms included the establishment of a civil service, the creation of a public health service, and the establishment of a system of public education.

The late republican period was also characterized by a number of reforms which were designed to improve the efficiency of the government. These reforms included the establishment of a civil service, the creation of a public health service, and the establishment of a system of public education. The late republican period was also characterized by a number of reforms which were designed to improve the efficiency of the government. These reforms included the establishment of a civil service, the creation of a public health service, and the establishment of a system of public education.

THE DATA RECONNAISSANCE PROGRAM

A. Field Survey Procedure

To conduct the data reconnaissance, a field survey group was established. Its task was to examine the forms, files and records on which information is systematically collected by the 100 to 150 agencies and departments to be surveyed. The principal instrument used in the data reconnaissance was the short form (see Appendix A), which permitted the members of the survey group to examine a document, a record, a file, a map, or a survey in a given department, and to describe the specific kinds of data it contained. The short form was used by the survey group to: record the title or name of the record, list all descriptive items contained therein, indicate the coverage of the record, designate the area covered (city-wide or part of the city), and indicate the time period covered. The survey group was expected to: determine the earliest date for which the data was collected; whether the data was still being collected; and, if the data item were no longer collected, when collection ceased. Space was provided on the form to indicate the department or agency collecting the data, and the address and telephone number of the person whose permission would be required to examine the record.

Following is the procedure used for making a survey of a given agency. Usually the Project Manager of the CRP (representing the Department of City Planning) and a member of the ADL consultant staff would orient the responsible department head or his agent on the purposes of the reconnaissance. An appointment would then be made to permit the field survey group to enter the department. In some instances, it was possible to work with the departmental representative; but for those city departments which were not members of the Inter-Agency Committee, an individual was usually delegated by the department director or bureau chief to assist the field survey group. The time spent in each agency varied from one day to two weeks. The number of items transcribed on the short forms in no way measured the number of records examined, since many records were rejected as not being relevant to the purposes of the study.

As a guide, the field survey group was instructed to seek out information: (1) on stocks of space (type of structure, condition, use); (2) on users of space (characteristics of occupants, changes in occupancy); (3) on investment behavior, particularly with respect to the users of property; (4) on the influence of public action on stocks of space and on the variety and composition of user occupants. In addition, the survey group was to determine whether data exists that will identify changes in the information categories over time and by location. Of particular concern was the need to seek out common units that will make it possible to aggregate and disaggregate the information to achieve similar units of collection.

B. General Characteristics of Existing Data

The data surveyed exists in a variety of forms - reports, statistical tables, ledgers, maps, photographs, etc.; the only common feature is the information provided, although certain general characteristics of existing data warrant mention. Little of the information that is systematically collected by city departments, other public agencies, and private sources is directed specifically toward the general problem of urban renewal, for the data was originally collected for other purposes. The information collected by these agencies is designed primarily to serve: 1) the internal needs of the agencies themselves, or 2) the needs of ultimate consumers to whom the agencies distribute summaries, reports and compilations of the information they collect. Very few of the agencies make primary observations; many of the private agencies use some compiled form of the information.

Most of the existing data will have to be reorganized or subjected to special tabulation or calculation to be of use in the later phases of the Community Renewal Program. For example, the model inputs will have to be of approximately the same time period; the units of observation must be at the same level of aggregation; the observations must cover an extensive area, preferably city-wide.

Some data is available in very specific form; other data is available in a more general form. At the most specific level, data is available about one dwelling unit, one parcel of land, one small section of a street, one household, or one family. These individual elements may be aggregated into meaningful groupings, such as in terms of location, specific time periods, a particular class or type of space, or a particular type of user. Much useful information is only available at a more aggregated level. While many city agencies collect information at a specific level, it is usually combined into summaries or aggregates that have meaning only for their internal administrative requirements or are used for reporting to a higher authority within city departments. Many private agencies are concerned only with information in the aggregate dealing with a large class of users, e.g., their customers, or a broad area of the City.

Many public and private agencies compile information for broad, general descriptive purposes. The transformation of this information into a usable form will be one of the major work elements in the Data Collection effort of Phase II. For example, information in aggregated summaries will need to be broken down and classified into elements which meet the aggregate requirements of the model. On the other hand, information which is detailed and specific may have to be combined into a more aggregated form for use in the model. Many descriptive characteristics of space and users, which operate continuously over time, will have to be measured at discrete points since the model will operate over discrete time intervals.

As further work proceeds, the Community Renewal Programming Model will be better articulated and made more specific, and its information requirements can be more precisely stated. The assessment of the utility of existing data will be a continuous "cut and fit" task until all of the information

inputs are in a form that meets the general time, location and level of aggregation requirements of the model. A major task of the early stages of Phase II will be to identify the data needs in specific enough terms to determine whether the requirements of the model can be met during Phases II and III.

C. Data Abstracts

Field work indicated that once existing data sources had been located and recorded on the short forms, they could best be handled for the various purposes of the project if they were assembled in the form of Data Abstracts, a useful document which could be distributed to the participating agencies. With the material in abstract form, it would be easier to select from the total universe a particular item that might be needed.

To accomplish this objective, a subject classifying system - termed the "Yellow Code" - was developed. (The term Yellow Code refers to the duplicate yellow copies of the short form which were coded by this system.) The Yellow Code is a simple code which organizes all data sources in accordance with their physical, financial, and historical characteristics. In general, all information collected was put into three broad divisions of the code: (1) information which describes some aspect of Space, (2) information which describes some aspect of Users, and (3) information which describes some aspect of the Organization and Administration of public and private agencies concerned with the land development process. Each broad division was subdivided. Space, for example, was further subdivided into land, buildings, utilities and facilities, streets and highways and transportation (other). Users was subdivided into households, establishments, institutions, and government. Organization and Administration was subdivided into local, public, other public and private. There are a number of further subdivisions, as shown in Appendix B.

The principal use of the Yellow Code is to provide a reference system for easy communication between the Consultant, the Department of City Planning, and any other departments and agencies who are the sources of data items. Communication will be further enhanced by use of the Data Abstract volume, 100 copies of which were prepared for distribution to all agencies who have made contributions to it.

D. Classification System

With more technical applications in mind, a second coding system - the "White Code/Data Source Retrieval System" - was also devised. This code is designed to deal with the difficult problem of relating data requirements of the Community Renewal Programming Model to existing sources of information. The White Code system in application makes matching comparisons between the data requirements of the model (in its present preliminary form) and the available information.

At this time, the model itself is at a preliminary stage, and its specific data requirements have not been established in final form. However, the attempt has been made to relate the White Code system to the general elements of the model that are now agreed upon. The system attempts to classify relevant characteristics of different types of space and "actors,"¹ as far as is reasonable. It also isolates actions of the actors from their characteristics for identification purposes, but it does so in a way that makes it possible to relate them easily when the system is in operation.

The nature of the system has been more directly prescribed by the way information has been recorded on the short forms. The major problem is that information on the short forms is not presented at a single level of aggregation. One form may be devoted to data from a single cell on all Building Permit Applications. Another may cover all annual reports of the Public Utilities Commission. This means that the coding system had to be designed to handle both the multi-subject general item, and the single-subject detailed item without conflict. Since the Data Reconnaissance Program has primarily focused on the information in the files at City Hall, the coding system classifies city government "actors" in the greatest detail.

The system developed is not conceptually elegant; it permits many overlaps and double codings. Nevertheless, this has certain advantages at this stage when the output of the Data Reconnaissance Program and the work program of the Community Renewal Program are at varying levels of specificity. A coding system for use now must be able to accept these various levels. To "clean it up" might be to eliminate certain needed categories of information. In general, the attempt has been to err in the direction of overcoding rather than undercoding; that is, to insure that no significant data item is lost.

General Description of the System

The code to be entered on each white copy, short form consists of a range of numbers organized into six positions as shown below:

<u>Name of Positions</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>
Example codes: 1)	61	20	XX	XXX	XX	CO
2)	XX	XX	XX	100	21	VV
3)	10	21	10	252	51	C4

¹ By "actors," we mean those persons and groups, private and public, whose actions affect the space-use system, i.e., change the use or condition of land, structures, and physical improvements in San Francisco. These include households, businesses and industries, investors, developers and public agencies. For a further discussion of this concept, see Technical Memorandum #2.

As the examples above indicate, in any one code certain positions may not be used and are thus occupied with "XX" or "XXX." Each position represents a different element, as listed in Appendix C.

A brief description of the elements included in each position follows. Position A relates to land-use categories at varying levels of generality and certain types of physical systems such as streets and highways, water distribution systems, etc. Position B describes the physical and/or economic characteristics of the types of space and physical systems listed for Position A; this involves such characteristics as topography, physical condition, tenure, taxes and assessments, neighborhood condition, etc.

Position C relates to characteristics of the users of various types of space and physical systems and to descriptions of their actions. The users classified here include all "actors" other than "institutional-actors" (government agencies, real estate financing enterprises, builders), who are classified in Position D. Position C would indicate, for example, the sex, race, occupation, etc. of the households using residential space, and whether they purchased or rented the space in question.

Position D, as noted above, refers to the names of particular institutions, agencies, groups, etc. (public and private) which act upon the space-use system. The classifications range from the specific, e.g., such well-defined governmental agencies as the Bureau of Building Inspection, to the general, with institutional categories such as the construction industry.

Position E classifications are similar to those in Position C in the sense that they refer either to descriptive characteristics of the institutional sectors or to their actions. For example, with respect to the Bureau of Building Inspection, the entry here might indicate that the data available describes the regulations which this department enforces as well as its organization.

Entries in Position F describe the geographic and temporal scope of the data coded in Positions A - E. The first space is occupied by a letter code which indicates whether the data is on a metropolitan-wide, city wide, etc. basis, or whether the specific source being coded describes a number of variables with varying geographical scopes. The second space is a digit which describes whether the data represents one point in time or, if it is a time series, the length of the series in decades.

E. CRP Library - An Information Retrieval System

As a means of making maximum use of information from documents, books, and papers collected specifically for the Community Renewal Program, there was need for a system for the classification and retrieval of this information. The aim was to develop a flexible method, suitable for manual operation, to provide the means for automatic and systematic review and retrieval.

Conventional library systems, based on hierarchical or combinatorial relationships among subject headings, are satisfactory if a priori knowledge is available about all categories of information and documents that are likely to be encountered during the life of the system. Such systems are not suitable, however, for the Community Renewal Program because such knowledge is not available in advance.

The most appropriate system for information retrieval appears to be a "coordinate indexing" system, modified to suit the specific needs of the Community Renewal Program and the simulation model which will be used to study the San Francisco renewal process. This type of system is based on the use of a group of key words extracted from material describing the subject. The selected words do not stand in any ordered relationship to one another, but are simply descriptive of the subject, and are arranged in alphabetical order. The major advantage of the coordinate indexing system is its ability to expand and conform to material as it is collected, without affecting the classification of material already classified.

To locate information with the use of this type of system, the researcher must think of those words which identify the information he is seeking. For example, if one is interested in information about the cost of rehabilitating multi-family dwellings, the key words would be rehabilitation costs and multi-family dwellings. The arrangement of words and their relationship to each other is unimportant.

The coordinate indexing system will be set up in the form of a "Scan-Column Index." The Index will provide for as many columns as required by the number of subject headings. Column headings will correspond to the major components of the model and major elements of the Community Renewal Program. Although this procedure results in some pre-classification of the material, it is designed primarily to give definition to the system and is not so detailed as to make the system inflexible.

The numbers of the documents being surveyed will be listed in the left-hand column, entitled Document Number. Key words which further describe and define information within the system will be listed in an accompanying index and arranged in alphabetical order with their corresponding codes. Record codes, corresponding to the key word or words assigned to each document, will be listed in the appropriate column opposite the document number.

Thus to locate documents containing information on specific subjects, the researcher would: 1) locate the key words in the Key-Word Index; 2) note the corresponding codes; 3) decide which columns in the Scan-Column Index would contain such information; 4) scan the column and identify the documents so coded.

Referring to the earlier example about the rehabilitation costs of multi-family dwellings, the researcher would first identify the key words and their respective codes - Multi-Family Dwellings, Code b and Rehabilitation Costs, Code e. The Residential column under space would then be selected as the appropriate column. Since Codes b and e appear opposite Document Numbers 00002 and 00003, these documents would be selected as the relevant sources. As indicated by the example and Figure 1, some documents, such as 00003, will contain more information than is required to answer a particular question. Others, such as 00004, may contain only part of what is required. Still others, such as 00001, may contain no information related to the question.

F. Highlights of Information Located in the Data Reconnaissance

Some of the kinds of information located in the various departments and non-city agencies which will be of potential value for the Community Renewal Program are highlighted below. More detailed information can be found in the Data Abstracts. The discussion below follows the classification scheme developed for the Data Abstracts and referred to in Section D.

In general, primary sources of information on space characteristics are found in city departments. For user information, the principal sources of primary data are in federal, state and non-city agencies. The bulk of the information highlighted below is systematically collected or compiled. For purposes of this summary, no differentiation has been made between primary and secondary sources. Some special studies are also described.

1. Space

Land, Physical

One of the best existing sources of information on the physical characteristics of land in San Francisco over an extended time period is the Land Use Block Cards, located in the Department of City Planning. These cards describe for each block all types of uses and the area devoted to each use. The periods covered are 1919, 1937, 1948, 1954 and 1962. It is possible via this record to get a very clear idea of the changes that have taken place in the use of land in the City over the last 40 years.

More current information on lot development areas of newly constructed buildings, and for converted or repaired structures, can be found on application for building permit records filed in the Central Permit Bureau.

TABLE I

Key Word Index

	<u>Code</u>
Construction	a
Multi-Family Dwellings	b
Offices	c
Rent	d
Rehabilitation Costs	e
Single-Family Dwellings	f
Tenure	g

SCAN COLUMN INDEX

Document No.	Space									
	Residential	Commercial	Industrial	Institutional	Vacant					
00001										
00002	be									
00003	bef									
00004	ae									
00005										

TABLE 7

Sea Water Levels

Station

Location
Date
Time
Tide
Height
Direction
Force

Sea Level

Sea Level									
Station									
Location									
Date									
Time									
Tide									
Height									
Direction									
Force									
1000									
1100									
1200									
1300									
1400									

Assessor's Block Books, located in the City Engineer's office, show the dedication of streets and subdivisions from 1960 to the present. Also located in the City Engineer's office are aerial photographs of the entire City for the years 1947, 1959 and 1962.

The effect of zoning on development can be traced by examining the Zoning Ordinance of 1921, located in the Department of City Planning. This record describes the districts, height limits, zone changes, and floor area ratios in force from 1921 to 1954.

Land, Financial

Much of the information on the financial characteristics of land is to be found in the Department of Real Estate and the Assessor's office. The Department of Real Estate records are concerned with the acquisitions and sales of property for all purposes. One record, for example, describes the land and improvements owned by the City and County of San Francisco from 1932 to date. A second record covers purchases, comparable sales, and appraisal data for real property bought for city purposes from 1932 to date. A parallel record covers general sales of property by the City back to 1940. Valuations of vacant land in San Francisco (including comparable sales) are also maintained back to 1950. (Records of the Assessor's office have not been surveyed.)

The Department of City Planning has records of land values by block, including land and improvements for the years 1923, 1933 and 1943. In addition, the Department has studies describing in detail the rate of absorption of industrial land in San Francisco for the periods 1919 to 1937, and 1937 to 1947.

A more general summary of real estate activity in San Francisco is located in the Bureau of Labor Research and Statistics of the State Department of Industrial Relations. The summary describes real estate sales in San Francisco for the period 1900 to 1950.

Land, Historical

Some of the more interesting records on the history of land development in the City are to be found in the Records Center. They include maps of early San Francisco, containing miscellaneous historical data on a city-wide basis on the location of old parks, street railways, historical landmarks, and old buildings. Also at the Records Center is the WPA relief model showing block plans and elevations of all buildings and their outlines, which were in existence during the period 1937 to 1939. In the Zoning Division of the Department of City Planning is an historical record file showing land use and zoning by lot and block number, for the years 1918, 1919, 1921, 1937 and for each year since 1947.

Assessors' Black Book, located in the City Engineer's Office, since the destruction of records and subdivisions from 1900 to the present. Also located in the City Engineer's Office are aerial photographs of the entire city for the years 1907, 1908 and 1909.

The subject of aerial photography was covered by examining the Bureau of Aeronautics of 1911, located in the Department of City Planning. This material described the aircraft, height, location, some changes, and listed some values in force from 1907 to 1909.

Page 1, continued

Then of the information on the historical development of land is to be found in the Department of Real Estate and the Assessors' Office. The Department of Real Estate records are concerned with the registration and sales of property for all purposes. One group of records, relating to the land and improvements owned by the City and County of San Francisco from 1907 to date. A second group covers general sales, comparable to the first group, but for the period 1907 to 1909. A third group covers general sales of property for the last date to 1900. Valuation of vacant land in San Francisco (including easements and other) was also furnished back to 1900. (Records of the Assessors' Office and some surveys.)

The Department of City Planning has records of land values by block, section and lot and improvements for the years 1907, 1908 and 1909. In addition, the Department has records describing in detail the value of improvements on industrial land in San Francisco for the periods 1907 to 1909, and 1909 to 1910.

A more general survey of real estate activity in San Francisco is located in the Bureau of Real Estate and Statistics of the State Department of Industrial Relations. This survey describes real estate sales in San Francisco for the period 1900 to 1910.

Page 2, continued

None of the more interesting records on the history of land development in the City can be found in the Bureau of Real Estate, but the records of the City Engineer, containing subdivision records, are of great value on the location of old parks, streets, and other features. Also at the Bureau of Real Estate, and at the City Engineer's Office, are records of the various subdivisions and improvements for the period 1907 to 1909. In addition, which were in existence during the period 1907 to 1909, the records of the Department of City Planning, as a historical record of the various land use and zoning by lot and block method, and the various records, 1907, 1908, 1909, and for each year since 1907.

Buildings, Physical

The information which the City collects on the physical characteristics of buildings is located in those agencies responsible for the code enforcement and regulatory activities of the City.

The Bureau of Building Inspection maintains an Approved Material file, which contains all information on: the materials of construction approved for use in the City; requests for approvals; specifications of materials; approval and disapproval actions. Also listed in this file is an alphabetical listing of the manufacturers of the materials that have been approved. This file goes back to 1956.

Other information on structures available in the Bureau of Building Inspection is concerned with the condition of buildings that conform to city ordinances, the reports of new construction or alterations, additions and repairs to buildings. The Central Permit Bureau of the Bureau of Building Inspection maintains the daily record of building permits that have been issued, by building type, the number of dwelling units, and the cost of construction. This file goes back to 1933.

The files of the Bureau of Sanitation and Housing Inspection of the Health Department contain considerable information on the condition of multi-storied buildings. Apartment houses and hotels are classed as businesses, and the Health Department maintains a file of applications for permits of occupancy which describes the building's: location, type of construction, number of stories, year built, number of rooms, number of apartments, number of units in each story, housekeeping units, and sizes. The record dates back to 1921.

In the case of new buildings, there is a separate record for each building describing its location, address, block, use, construction type, year built, number of stories, number of rooms in apartments, size of apartments. These records go back to 1940.

The Health Department's Annual Inspection Program itemizes code violations by type for all multiple structures in the City. This program, which began in 1954, is an important source of information on the condition of multiple structures in the City.

A new procedure, the Check List program, is designed to measure the construction activity generated by an adequate enforcement program. Check Lists are sent out to owners, indicating those violations that exist in their buildings which require a building permit for correction. Records indicate the number of permits that have been applied for. Since this is a recent program, the records go back only to 1961.

The Bureau of Fire Prevention and Investigation of the Fire Department maintains a Building Permit Report file, indicating the location, number of stories, area per square foot, the type of occupancy, the number of apartments and rooms of all structures in the City, dating back to 1928.

The Central Permit Bureau maintains a file on all applications for permits to demolish buildings. These permits indicate the number of families, their location, the type of construction, number of stories, number of family units, and the date that such a permit was issued. This file dates back to 1906. The Central Permit Bureau also maintains files on application for permit for additions, alterations, and repairs of existing structures. These documents describe the location, number of stories, total costs, the present and proposed uses, numbers of families, present and proposed other buildings on the lot, and the description of the work to be performed.

Buildings, Financial

A very important record on the cost of construction - the Building Index Form - is located in the Central Permit Bureau. This record contains information for all buildings since 1933 by location, the total cost, the date of construction, type of construction, whether it is an alteration of an existing building or new construction, the number of stories, the number of families that are involved, and the occupancy characteristics of the building.

The Fee Registrar, located in the office of the City Recorder, records fees paid for tax purposes in dollars per thousand dollars of value. The value of the Internal Revenue tax stamps on each document makes it possible to compute purchase and sales prices of real property transactions.

The Department of Real Estate maintains records on comparable sales of adjacent property on all property purchased by the City, by type of improvement, floor area, number of rooms, and selling price.

Other interesting records showing the cost of repair and rehabilitation of structures to raise them to a condition sufficient to meet legal requirements are located in both the Urban Renewal Division of the Bureau of Building Inspection and the Bureau of Sanitation and Housing Inspection. The Health Department maintains in the progress reports of the Check List program the cost of upgrading structures to meet legal requirements. A feasibility of rehabilitation study was done for the Conservation Districts by the Urban Renewal Division of the Bureau of Building Inspection during the same period.

Buildings, Historical

One of the finest collections of historical information concerning buildings in San Francisco is located in the City Engineer's office. The collection, dating back to 1906, is found in the Historical Photo Index, filed by subject and street location. Early financial data on buildings is described in the Stafford Report, located in the Department of Real Estate and at the Records Center. The data was prepared by a consultant engaged by the City during the period 1926 to 1928 to examine the improvement values of all buildings in San Francisco, by the number of rooms, by block number, by occupancy, by age, by per cent depreciated, and by value in 1926 and 1928 terms. All of this information has also been mapped.

Utilities and Facilities, Physical

The most important record on public facilities in San Francisco is the City's Master Plan, which describes the present and proposed location of all schools, fire houses, libraries, hospitals, parks, reservoirs and other public facilities. This plan, approved in 1955, was prepared by and is located in the Department of City Planning.

Another valuable record on public facilities is the Street Improvement Sheets of the Design Division, City Engineer's office. These sheets describe the original specifications, capacity and cost of streets and all pertinent facilities including sewers, dating back to 1906.

The Master Card file of the Water Department describes the location, meter size, account number, and the on-off water record for every structure in the City of San Francisco. It also lists the previous address of the present customer. The file contains information from 1930 to date. This record is an important source of information on industrial and commercial mobility, vacancies and turnover rates by type of land use.

Streets and Highways

Descriptions of streets, grades, widenings, openings, closings and extensions, from 1850 to the present time, can be found in the Recorder's Index to Maps, one of the longest established records maintained by the Recorder's office. Active records and maps are located in the Survey and Mapping section of the City Engineer's office. The maps provide a detailed historical record of the physical development of San Francisco.

Another source of information is the Master Traffic Way Plan for freeways, major thoroughfares and parkways, located in the Department of City Planning. This plan was adopted, along with other master plan elements, in 1955.

Transportation, Physical

The Fire Department and Traffic Engineering Bureau maintain similar records on auto parking spaces, the location of commercial parking areas, the number of stalls, and the plot plans for each commercial parking area from 1932 to the present time. With respect to on-street parking, the Traffic Bureau maintains detailed records on IBM cards of all curb painting for white, yellow, red and green zones on a city-wide basis. These records began in 1948. The Bureau of Traffic Engineering also maintains a similar record on IBM cards for all parking signs. Both the Traffic Engineering section of the Police Department and the Bureau of Traffic Engineering have data on traffic accidents, by location, time, type, date, back to 1952.

The Municipal Railway maintains its schedules on runs, stopping points, the number of trips, types of carriers that have been employed on all routes on a city-wide basis, daily from 1912 to the present time. The Arnold Report on the History of Public Transit in San Francisco, written in 1948, is one of

Public Health Department

The most important branch of public health is the Sanitation Department, which is responsible for the health and general welfare of the City. This branch is divided into several divisions, including the Division of Sanitation, the Division of Health, and the Division of Public Health. The Division of Sanitation is responsible for the collection and disposal of garbage, the maintenance of public buildings, and the regulation of the food and drug trade. The Division of Health is responsible for the control of communicable diseases, the regulation of the practice of medicine and surgery, and the control of the sale of alcoholic liquors. The Division of Public Health is responsible for the control of the sale of tobacco, the regulation of the sale of firearms, and the control of the sale of explosives.

Another important branch of public health is the Division of Public Health, which is responsible for the control of the sale of tobacco, the regulation of the sale of firearms, and the control of the sale of explosives. This division is also responsible for the control of the sale of alcoholic liquors, the regulation of the practice of medicine and surgery, and the control of the sale of firearms and explosives.

The Division of Public Health is also responsible for the control of the sale of tobacco, the regulation of the sale of firearms, and the control of the sale of explosives. This division is also responsible for the control of the sale of alcoholic liquors, the regulation of the practice of medicine and surgery, and the control of the sale of firearms and explosives.

Public Health Department

The Division of Public Health is also responsible for the control of the sale of tobacco, the regulation of the sale of firearms, and the control of the sale of explosives. This division is also responsible for the control of the sale of alcoholic liquors, the regulation of the practice of medicine and surgery, and the control of the sale of firearms and explosives.

The Division of Public Health is also responsible for the control of the sale of tobacco, the regulation of the sale of firearms, and the control of the sale of explosives. This division is also responsible for the control of the sale of alcoholic liquors, the regulation of the practice of medicine and surgery, and the control of the sale of firearms and explosives.

Public Health Department

The Division of Public Health is also responsible for the control of the sale of tobacco, the regulation of the sale of firearms, and the control of the sale of explosives. This division is also responsible for the control of the sale of alcoholic liquors, the regulation of the practice of medicine and surgery, and the control of the sale of firearms and explosives.

The Division of Public Health is also responsible for the control of the sale of tobacco, the regulation of the sale of firearms, and the control of the sale of explosives. This division is also responsible for the control of the sale of alcoholic liquors, the regulation of the practice of medicine and surgery, and the control of the sale of firearms and explosives.

the most comprehensive reports ever written on this subject. It describes the period of early streetcar and transit development in San Francisco back to 1850 and contains much additional historical information. This report is located in the Utilities Engineering Bureau, Municipal Railway section of the Public Utilities Commission.

2. Users

Households, Physical

The principal source of population data about San Francisco is the United States Census of Population. However, numerous studies, dealing with population characteristics, population estimates and mortality data, have been made by local agencies. The Vital Statistics Bureau of the Health Department, for example, assembles mortality data. From 1950 to the present, both death and birth records have been maintained on IBM cards, describing for all births and deaths the sex, color, age, occupation, birthplace, address, census tract and marital status.

A major population study was done by the Department of City Planning. It includes population, economic and social data and summaries of the characteristics from 1860 to 1940.

The Department of Health in 1950 made a population projection for 1960 by sex, by age group, and by race.

Households, Social

An important current source of information on the social characteristics of households of San Francisco is a nation-wide study, the "Inter-American Investigation on Mortality." The study includes data on every third death sampled and the characteristics of the deceased by sex, age, address by census area, marital status, economic data, employment, occupation, and residential history.

Information on minority groups is available from a Redevelopment Agency tabulation, covering the period 1940 to 1951. This tabulation shows minority occupancy by block.

The Governor's Advisory Commission on Housing Problems has produced a survey of housing needs for San Francisco and other counties of California, describing household composition, the last place of residence, required and actual living space, number of vacancies, vacancy rates by type of structure, and units available to non-whites by size. This information has been mapped. The survey is based on a compilation of data from 1951 to 1962.

Households, Economic

The bulk of the information on the economic characteristics of San Francisco households deals with employment, occupation, and income characteristics. Some data is available on rents. One of the more important sources of these records is the Master Card file of the Water Department, which lists new customers, the kinds of businesses, and the kinds of occupations and firm names that have come into the City from 1930. Another is the consumer price index for moderate income families, maintained by the Bureau of Labor Research and Statistics of the State Department of Industrial Relations. The indexes have been classified according to typical consumer expenditure patterns from 1915 to 1950.

The Department of City Planning tabulated the number of persons employed in San Francisco industries by Standard Industrial Classification (SIC) types for the period 1900 to 1950.

The Franchise Tax Board has maintained records since 1940 on individual incomes by family size and occupation. The Housing Authority of San Francisco conducted a family income and rent survey showing the number of rooms, the number of tenants in the dwelling units, the value of the structure, the contract and gross monthly rents. This report is a one-time study completed in 1950.

The Department of City Planning has an age tree showing changes in population distribution in San Francisco by decade from 1910 to 1960.

The Department of Health has examined household sizes from 1912 to 1945, showing the average number of children per family, and the marriage and birth rates per thousand for the entire City.

Establishments, Physical

Much of the information about physical establishments is located in the License Bureau, the Health Department, the State Department of Employment and the United Community Fund.

For those commercial and industrial establishments subject to license, the License Bureau maintains files on business licenses by type, street, address, name of business, for the past five years. Since apartment houses and hotels are considered commercial establishments, the License Bureau records apartment house data on IBM cards filed by owner's name, address, and the number of rooms, also for a five-year period. The Health Department records are limited to food producers, wholesalers, retailers, and food dealers; the records cover occupancy permits and certification of sanitation.

The State Department of Employment maintains a list of employers who are covered by the Unemployment Insurance program, classified according to type of establishment (Standard Industrial Classification code) and number of employees.

The United Community Fund has active files of all employers who participated in the United Crusade Program. This file is probably the most complete listing of San Francisco commercial and industrial establishments.

Establishments, Economic

Statistics on average hotel occupancy, new office space added, rental area, office building vacancy, and rental information for the period 1950 to 1961 can be found in a major study conducted by the Redevelopment Agency in 1962 for the downtown area.

Institutions, Physical

The Department of City Planning has reports on San Francisco Public Schools indicating attendance, income expenditures by school size, cost, age, and type of construction of individual school buildings, from 1938 to 1947. The Fire Department maintains records on the total number of pupils in all schools, from 1960 to date. This category primarily concerns the public schools, information about which will be included in a later supplement to the Data Abstracts. (The Board of Education was not surveyed during the first survey period.)

Government, Financial

The bulk of all information on local government finance in San Francisco is maintained in the Controller's Department. The annual publication of the consolidated budget of San Francisco contains information on all revenues and expenditures. The annual report of the Controller, which is published concurrently with the budget, dates back to 1932.

The San Francisco Municipal Reports, a collection of annual reports of all city departments, are maintained in a number of locations. The San Francisco Law Library in City Hall is the most available source. The reports have been published from 1850 to date.

The Department of City Planning maintains a special file on the Capital Improvement Program of the City, indicating the schedule, the expenditures, the source of funds, and the individual projects itemized by department. This report has been published annually since 1949.

Government, Service and Property

The outstanding records describing local public services to property are those maintained in the Fire Department and the City Engineer's office. The Fire Department maintains a comprehensive ledger on the location of fires by street address, indicating the time, date, extent, type of structure, damage, and the cause. They have maintained this record since 1940. This ledger is extremely thorough and enables one to assess fire risk and conflagration hazards anywhere in the City.

The City Engineer's office has sewer maps indicating the population density by drainage district and the estimates of residential and commercial use by district. This data has been used to make a projection of use to the year 1970. Its purpose is to enable the Design Division of the City Engineer's office to forecast changes in sewer capacity.

Government, Service to People

Some of the best records describing government services to people are to be found in the Department of Public Welfare and in the Police Department. (The latter will be reported on in the first supplement to the Data Abstracts.) The Department of Public Welfare issues a monthly report to the State of California describing welfare programs and services, and the expenditures by program. This extremely thorough report indicates case loads, the prognosis for rehabilitation of families, and other significant data on welfare services to the people of San Francisco. It has been published since 1942.

More significant perhaps, for purposes of the Community Renewal Program, is another record of the Welfare Department indicating direct payments of rent by address, by rate per month, and by family size. This record has been maintained since 1940. Some of the information that will be needed on rents by type of structure for lower income families will come from this particular source.

Among the non-city agencies, the Department of Employment records placements of job seekers by age group, sex and occupation. This record is on IBM cards and has been maintained since 1946.

Government, Historical

An interesting historical record was found in the Traffic Engineering Department of the Department of Public Works, a one-time report describing WPA activity during the 1935 to 1939 period and indicating projects by type, the department benefitted, and the cost of the projects.

3. Organization and Administration

Public Actions (Local)

Major public action records covering the land development process are concerned primarily with regulatory actions of city agencies dealing with building, construction, and changes in land use. The Department of City Planning has files going back to 1921 on zoning, condition use, variances and zone changes. The major public action of the Department of City Planning was the preparation of a Master Plan for San Francisco describing densities for all land uses - commercial, industrial, institutional and public areas. It was passed in 1955. The Department of City Planning, for its own purposes, has mapped building permits on block books for the period 1948 to 1953.

The City Engineer's office has been very busy in the past few months in connection with the various projects of the city. The office has been very busy in the past few months in connection with the various projects of the city. The office has been very busy in the past few months in connection with the various projects of the city.

Engineering Department

The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months.

The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months.

The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months.

Engineering Department

The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months.

Engineering Department

Engineering Department

The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months. The work of the Engineering Department has been very busy in the past few months.

The Board of Permit Appeals maintains a file on all appeals and notices of the actions taken, back to 1932.

Public, Finance (Local)

The Controller's Department publishes the annual report of the Controller, dating back to 1932. In this report are yearly details on the tax rolls, revenues, expenditures, and accounts by departments.

Public, Function (Local)

The principal records describing functions of departments are contained in annual reports of each department. The complete file of annual reports of all departments is maintained in three locations - the San Francisco Law Library, the Public Library, and the Library of the Board of Supervisors.

Public, Legal (Local)

The principal relevant legal records are the ordinances of the Board of Supervisors, the amendments to the City Charter, the court records, and reports on the general obligations bonds of San Francisco. The Recorder's office maintains a general index of grantors and grantees by name, year, and kind of instrument and where recorded, back to 1919. These are the basic files on all property, transfers and property titles in San Francisco. The Bureau of Building Inspection of the Department of Public Works maintains a building code file which includes the building code, its revisions, requests for revision, actions on the requests, files of other codes, and comparison with other codes. The file has been maintained since 1960.

Public, Procedures (Local)

Records involving procedures of the departments are mostly applications for permits and represent the principal contact of the departments with the general public. Information on the applicant and his property appearing on the applications is of great relevance to the purposes of the Community Renewal Program, since it describes many characteristics of space and of the users of space. As might be expected, the bulk of the procedural records are maintained by the regulatory agencies in the Bureau of Building Inspection, the Zoning Division of the Department of City Planning, and the Health Department.

Among the more important procedural records in the Bureau of Building Inspection is the Report of Residential Building. This report contains the address, the zoning, the fire limits, the number of structures on the property, whether the property is licensed, a plot plan, a certificate of occupancy, the present use, the date of original construction, the type of original occupancy, permits received and kind of permits to date. The report is made only for buildings where the prospective purchaser makes a request for the information. Consequently, the record describes only buildings involved in recent property transactions and for which the purchaser has made a request.

The Board of Directors is authorized to file all reports and minutes of the Board of Directors with the Secretary of State.

Article IV - Officers and Directors

The Corporation's Board of Directors shall consist of not less than five (5) nor more than fifteen (15) directors, who shall hold office for a term of three (3) years and until their successors are elected.

Article V - Powers and Duties of Directors

The Corporation's Board of Directors shall have the authority to manage the business of the Corporation and to exercise all the powers and duties of the Corporation.

Article VI - Officers and Directors

The Corporation's Board of Directors shall have the authority to elect and remove the officers and directors of the Corporation. The Board of Directors shall also have the authority to elect and remove the officers and directors of the Corporation.

Article VII - Officers and Directors

The Corporation's Board of Directors shall have the authority to elect and remove the officers and directors of the Corporation. The Board of Directors shall also have the authority to elect and remove the officers and directors of the Corporation.

The Corporation's Board of Directors shall have the authority to elect and remove the officers and directors of the Corporation. The Board of Directors shall also have the authority to elect and remove the officers and directors of the Corporation.

Other important records maintained by the Bureau of Building Inspection are: 1) applications for permits to install plumbing, gas and water; 2) applications for building permits for type 1, 2, 3 and 4 structures; and 3) applications for building permits for type 5 structures. All of these permits contain detailed information on the location, lot description, size of structure, other buildings on the lot, lot and block number, type, occupancy, number of dwelling units, ground floor area, number of stories, basements, total cost, design line loads, type of use of the structure (commercial or residential), date of application, and date of the certificate of completion. These records are maintained back to 1942.

The Zoning Division of the Department of City Planning issues applications concerned with changes in land use. These include applications for variances, amendments of zoning districts, conditional use permits, and records on nonconforming uses. Records of these applications are maintained back to 1921. They describe the date of the application, the location, the lot and block number, the zoning district, the conformance with the need for permits or licenses, and a statement of intention of the owner or builder.

The Bureau of Sanitation and Housing Inspection has recently installed a new data system called the Urban Renewal Control Card. It applies only to multiple structures in the City, but it contains some significant information on this type of structure, including the type of construction, total number of units, the original occupancy in number of units, the dates of permits to correct violations, cost data, the present occupancy, and any changes in residential occupancy that resulted from building activity. Unfortunately, this program only started in 1960.

Public, Historical (Local)

The Department of City Planning has prepared a detailed report on the history of General Obligation Bond Issues. Each bond issue is described by the date, the amount of the bond, the action of the voters, the amount offered, the amount sold, the amount required, and the amount outstanding. In addition, statistical description has been made of voter actions by type of bond issue.

It is anticipated that many of the records and information sources described above will provide major inputs into the Community Renewal Programming Model. The limitations of the data, some of which have been cited, primarily involve the units of aggregation, employed by various departments, the times of the observations, the precision and reliability of collection, and the extent and coverage of the information.

In addition to the data highlighted above, a number of special studies were identified during the course of the reconnaissance program. Some of these studies will provide valuable insights into important behavioral characteristics of the population and its use of space in the City. The most important of those studies are listed in Appendix D.

G. Participating Agencies

A list of the city departments and agencies that participated in the Data Reconnaissance Program and the number of data items identified by subject are shown in Table II.

TABLE II

Number of Items Collected
Subject/Source Breakdown

(Original Issue)

DEPARTMENT &
AGENCY

City & County
of San Francisco

DEPARTMENT & AGENCY	SPACE						USERS						
	Land	Buildings	Utilities & Facilities	Streets & Highways	Transportation (other)	Total	Households	Establishments	Institutions	Government	Total	Organization & Administration	Total
Controller										5	5	5	10
Finance & Records	12	22	5	2	1	42	27	9		10	46	25	113
County Clerk ¹	1	1	1	1	1	5						6	11
Records Center	5	21	1	1		28	5	3			8	9	45
Registrar of Voters							8	1			9	5	14
Tax Collector, Lic.							8	1			9	5	14
Tax Collector, Prop.	6		3			9	6	4		10	20		29
Fire Dept.	2	10	5			17	1	7	1		9	8	34
Housing Auth.	6	17	1	2	1	27	85	2		15	102	7	136
Planning Dept.	70	39	13	29	15	166	46	18	10	8	82	47	295
Property, Real Estate	24	8	7	1		40	1			9	10	5	55
Public Health Dept.	2	31	2		1	36	47	11	4	3	65	40	141
Public Welfare Dept.	3	8				11	102		36	27	165	63	239
Public Works Dept.	118	58	118	84	23	401	37	11	6	16	70	95	566
Bur. of Accounts													
Bur. of Arch.		2				2			2	7	9	5	16
Bur. of Bldg. Insp.	11	35	2	1	1	50	14	1			15	53	118
Bur. of Eng.	100	2	116	83	22	323	18	6	3	9	36	23	382
Gen. Permits Bur.	7	19				26	5	4	1		10	14	50

1. Includes Recorder's Office

Arthur D. Little, Inc.

TABLE II

Number of Items Collected
Subject/Source Breakdown

(Original Issue)

DEPARTMENT & AGENCY	SPACE						USERS						
	Land	Buildings	Utilities & Facilities	Streets & Highways	Transportation (other)	Total	Households	Establishments	Institutions	Government	Total	Organization & Administration	Total
Controller										5	5	5	10
<u>Finance & Records</u>	<u>12</u>	<u>22</u>	<u>5</u>	<u>2</u>	<u>1</u>	<u>42</u>	<u>27</u>	<u>9</u>		<u>10</u>	<u>46</u>	<u>25</u>	<u>113</u>
County Clerk ¹	1	1	1	1	1	5						6	11
Records Center	5	21	1	1		28	5	3			8	9	45
Registrar of Voters							8	1			9	5	14
Tax Collector, Lic.							8	1			9	5	14
Tax Collector, Prop.	6		3			9	6	4		10	20		29
Fire Dept.	2	10	5			17	1	7	1		9	8	34
Housing Auth.	6	17	1	2	1	27	85	2		15	102	7	136
Planning Dept.	70	39	13	29	15	166	46	18	10	8	82	47	295
Property, Real Estate	24	8	7	1		40	1			9	10	5	55
Public Health Dept.	2	31	2		1	36	47	11	4	3	65	40	141
Public Welfare Dept.	3	8				11	102		36	27	165	63	239
<u>Public Works Dept.</u>	<u>118</u>	<u>58</u>	<u>118</u>	<u>84</u>	<u>23</u>	<u>401</u>	<u>37</u>	<u>11</u>	<u>6</u>	<u>16</u>	<u>70</u>	<u>95</u>	<u>566</u>
Bur. of Accounts		2				2			2	7	9	5	16
Bur. of Arch.													
Bur. of Bldg. Insp.	11	35	2	1	1	50	14	1			15	53	118
Bur. of Eng.	100	2	116	83	22	323	18	6	3	9	36	23	382
Gen. Permits Bur.	7	19				26	5	4	1		10	14	50

1. Includes Recorder's Office

Arthur D. Little, Inc.

APPENDICES

APPENDIX

APPENDIX A

Short Form Data Inventory

1. Item: _____
2. Coverage: ☐ City-wide ☐ Other (Specify) _____
3. Time period covered: From _____ To _____
4. Location of data: (Department or agency) _____
5. Person in charge of record: _____

Form for Self Declaration

1. Name _____
2. Designation _____ ☐ C/O _____ ☐ Other (Specify) _____
3. Firm/Institution/Company Name _____
4. Declaration of interest _____
5. Signature and stamp of the officer _____

APPENDIX B

Yellow Code Data System Elements

SUBJECT	CODES
SPACE	
Land, Physical	1-1-1
Land, Financial	1-1-2
Land, Historical	1-1-3
Buildings, Physical	1-2-1
Buildings, Financial	1-2-2
Buildings, Historical	1-2-3
Utilities & Facilities, Physical	1-3-1
Utilities & Facilities, Financial	1-3-2
Utilities & Facilities, Historical	1-3-3
Streets & Highways, Physical	1-4-1
Streets & Highways, Financial	1-4-2
Streets & Highways, Historical	1-4-3
Transportation (other), Physical	1-5-1
Transportation (other), Financial	1-5-2
Transportation (other), Historical	1-5-3
USERS	
Households, Physical	2-1-1
Households, Social	2-1-2
Households, Economic	2-1-3
Households, Historical	2-1-4
Establishments, Physical	2-2-1
Establishments, Social	2-2-2
Establishments, Economic	2-2-3
Establishments, Historical	2-2-4
Institutions, Physical	2-3-1
Institutions, Social	2-3-2
Institutions, Economic	2-3-3
Institutions, Historical	2-3-4
Government, Financial	2-4-1
Government, Service - Property	2-4-2
Government, Service - People	2-4-3
Government, Historical	2-4-4

Yellow-Cap Warbler Species

1950

1951

1952

Land, Florida
Land, Florida
Land, Florida

Land, Florida
Land, Florida
Land, Florida

Land, Florida
Land, Florida
Land, Florida

Land, Florida
Land, Florida
Land, Florida

Land, Florida
Land, Florida
Land, Florida

1953

Land, Florida
Land, Florida
Land, Florida

Land, Florida
Land, Florida
Land, Florida

Land, Florida
Land, Florida
Land, Florida

Land, Florida
Land, Florida
Land, Florida

Land, Florida
Land, Florida
Land, Florida

Yellow Code Data System Elements

ORGANIZATION AND ADMINISTRATION

Public (Local), Actions	3-1-1
Public (Local), Finance	3-1-2
Public (Local), Function	3-1-3
Public (Local), Legal	3-1-4
Public (Local), Organization	3-1-5
Public (Local), Procedures	3-1-6
Public (Local), Historical	3-1-7
Public (other), Actions	3-2-1
Public (other), Finance	3-2-2
Public (other), Function	3-2-3
Public (other), Legal	3-2-4
Public (other), Organization	3-2-5
Public (other), Procedures	3-2-6
Public (other), Historical	3-2-7
Private, Actions	3-3-1
Private, Finance	3-3-2
Private, Function	3-3-3
Private, Legal	3-3-4
Private, Organization	3-3-5
Private, Procedures	3-3-6
Private, Historical	3-3-7

APPENDIX C

WHITE CODE DATA RETRIEVAL SYSTEM ELEMENTS

POSITION A

- 00 SPACE (GEN.)
- 10 Residential (Gen.)
- 11 1-Family & Duplex
- 12 Medium Density
- 13 Hi-Rise Apt. & Hotel
- 14 Other Specific Residential
- 20 Non-Residential Space (Gen.)
- 30 Commercial (Gen.)
- 31 Retail
- 32 Offices
- 33 Wholesale
- 34 Other Specific Commerical
- 40 Industrial (Gen.)
- 41 Mfg. Industries
- 42 Transport Terminals
- 43 Utilities (Land)
- 44 Other Specific Industrial
- 50 Institutional (Gen.)
- 51 Governmental
- 52 Educational
- 53 Recreational
- 54 Religious
- 55 Health-Hospitals
- 56 Other Specific Institutional
- 60 Vacant (Gen.)
- 70 OPERATING SYSTEMS (GEN.)
- 80 Transportation Systems (Gen.)
- 81 Streets and Highways
- 82 Transit
- 83 Air, Rail, and Other
- 90 Urilities Systems (Gen.)
- 91 Water
- 92 Gas, Electric, Power
- 93 Sewers and Waste Disposal

POSITION B

- 00 SPACE CHARACTERISTICS (GEN.)
- 10 Physical Characteristics (Gen.)
- 11 Numbers
- 12 Size of Unit
- 13 Topography
- 14 Climate
- 15 View
- 16 Visual Design Factors
- 20 Standards (Gen.)
- 21 Physical Condition
- 22 Capacity
- 23 Measures of Operating Effic.
- 30 Economic Characteristics (Gen)
- 31 Tenure
- 32 Rent & Purchase Price
- 33 Taxes & Assessment
- 34 Market Value
- 35 Construction Costs
- 36 Sources of Financing
- 40 Location Characteristics (Gen.)
- 41 Neighborhood Condition
- 42 Accessibility

White Code Data Retrieval System Elements

POSITION C

00	<u>USER-CHARACTERISTICS (GEN.)</u>
01	Number
02	Size of Unit (people/household employees/establishment)
10	<u>User-Social Characteristics (Gen.)</u>
11	Sex
12	Race
13	Marital Status
14	Education
15	Birth & Death
16	Health
17	Crime
18	Age
30	<u>User-Economic Characteristics (Gen.)</u>
31	Income (Profits, Sales)
32	Occupation
33	Industry Group
34	Employment
40	<u>User-Actions on Space (Gen.)</u>
41	Purchases
42	Rentals
43	Choice of Location
44	Maintenance
45	Improvement
46	Construction
50	<u>User-Actions (Other)</u>

POSITION D

100	<u>INTER-LEVEL (GEN.)</u>
110	Inter-Level, Government
120	Inter-Level, Private
200	<u>LOCAL GOVERNMENT (GEN.)</u>
210	<u>Organization, Administrative & Legislative Functions (Gen.)</u>
211	Board of Supervisors
212	Mayor
213	Chief Admin. Officer
220	<u>Financial & Records Functions (Gen.)</u>
221	Clerk & Recorder
222	Assessor & Tax Collector
223	Controller
224	Judiciary
230	<u>Community Service Functions (Gen.)</u>
231	Law Enforcement Functions (Policy, Prisons, etc.)
232	Fire Prevention Functions
233	Library
234	Education
235	Health & Hospitals
236	Welfare
240	<u>Physical Development & Property Related Functions (Gen.)</u>
241	Property Management
242	City Planning (Gen.)
243	Zoning & Appeals
244	Capital Improvement Program
245	Other
246	Inter-Agency Comt. for UR
247	Redevelopment Agency
248	Housing Authority
249	Recreation & Parks

White Code Data Retrieval System Elements

POSITION D (cont.)

250	Parking Authority	320	<u>Private Commercial Assns. (Gen.)</u>
251	Dept. Public Works (Gen.)	321	Trade Groups
252	Building Inspection & Appeals	322	Industry Groups
253	Urban Renewal	323	Unions
254	Architecture	324	Shipping
255	Engineering	325	Other Private Commercial Assns.
256	Highways	330	<u>Component Institutions of Space Markets (Gen.)</u>
257	Real Estate	331	Real Estate Industry
258	Waterways	332	Building Industry
259	Public Utilities Functions (Gen.)	333	Finance Industry
260	Airport	334	Other
261	Hetch-Hetchy	400	<u>REGIONAL, PUBLIC AND PRIVATE (GEN.)</u>
262	Light & Power	410	<u>Regional Public (Gen.)</u>
263	Municipal Railway	411	Air Pollution Control Dist.
264	Public Services	412	Water Pollution
265	Water Dept.	413	Rapid Transit
280	Non-Government, Local, Public	414	Assn. of Bay Area Govts. (ABAG)
281	Institutions (Gen.)	415	Planning District
282	Hospitals	416	Bridges
283	Churches	417	County Governments
284	Schools	418	City Governments
290	Port Authority	419	Other
300	<u>LOCAL PRIVATE (GEN.)</u>	450	<u>Regional Private (Gen.)</u>
310	<u>Citizens Interest Groups (Gen.)</u>	460	<u>Citizens Interest Groups (Gen.)</u>
311	Physical Development Interest Groups (Gen.)	461	Physical Devt. Interest Groups
312	Neighborhood Organization & Church Groups	462	Political Parties, etc.
313	Political Parties & Groups	463	Other
314	Other Citizen Groups	470	<u>Commercial Assns. (Gen.)</u>
		471	Industry Groups (Bay Area Coun. etc.)
		472	Trade Groups
		473	Union Groups
		474	Other

White Code Data Retrieval System Elements

POSITION D (cont.)

480 Component Inst. of Space Markets
(Gen.)

481 Real Estate Industry

482 Building Industry

483 Finance Industry

484 Other

500 STATE (GEN.)

510 State Government

520 County Governments out of Bay Area

530 Cities Outside of Bay Area

550 Private Groups

600 NATIONAL & INTERNATIONAL (GEN.)

610 National Government

650 National Private

POSITION E

00 INSTITUTIONAL ACTOR CHARACTER-
ISTICS & ACTIONS (GEN.)

Organization & Admin. (Gen.)

02 Type of Operation (Gen.)

03 Functions & Procedures

04 Related Legal Regs.

05 Organization

06 Financial Matters (Gen.)

07 Budgets

08 Costs - Expenditures

09 Revenue

10 Work Loads

11 History

50 Institutional Actor-Action on
Space (Gen.)

51 Regulations

52 Finance & Investment

53 Direct Improvements

54 Direct Construction

70 Institutional Actor-Actions
(Other)

POSITION F

GEOGRAPHICAL COVERAGE

N Total U. S. (Total or Part) &
International Selected

S State of California (Total or
Part)

R S. F. Bay Area Metro. Region
(Total or Part)

C City of San Francisco (Total)

A Part of City of San Francisco

P Sample of San Francisco on
Non-Contiguous Area Basis

V More than one of the above.

TIME PERIOD COVERAGE

0 One time only

1 Series less than 10 yrs.

2 Series 10-20 yrs.

3. Series 20-30 yrs.

4 Series 30-40 yrs.

5 Series 40-50 yrs.

6 Series 50-60 yrs.

7 Series 60-70 yrs.

V More than one of the above
(on different parts)

1F, 2F, etc. series incl. forecast.

APPENDIX D

Special Studies and Reports

MISCELLANEOUS AND INDEPENDENT REPORTS

1. San Francisco-Oakland Metropolitan Area-Population Report of White, Negro, and Other Races. Prepared by Far West Surveys for KSAN Radio (1961).
2. Market Outlook. P. G. & E. publication (Annual).
3. San Francisco Bay Area Residential Mortgage Market. Study compiled by U.C. Bureau of Business and Economic Research for the HHFA (1950-1951).
4. Trends in Services Given by Social Welfare and Health Agencies in San Francisco. Community Chest Study (1950-1955).
5. One in Ten: Facts about Older People in San Francisco. Prepared by Community Chest.
6. Regional Planning and Metropolitan Government Proposals for the San Francisco Bay Area (1900-1959).
7. The San Francisco Story: How Metropolitan San Francisco Bay Area Proposes to Meet Its Transit Needs. Published by Bank of America (April 1961).
8. San Francisco-Oakland Metropolitan Area. Published by Bank of America, Municipal Bond Department (1960).
9. San Francisco Housing Fact Book. Prepared by Real Estate Research Corp. for SPUR (May 1962).
10. Convention Facilities Needs in San Francisco. Prepared by Industrial Planning Association (1958).
11. The Problem of Government in the San Francisco Bay Region. Prepared by University of California Bureau of Public Administration (1948).
12. Future Development of the San Francisco Bay Area, 1960-2020. Prepared by U.S. Department of Commerce for U.S. Army Engineers.
13. General Planning Forecast - Northern California Area. Prepared by Pacific Telephone & Telegraph Co.
14. Typical Electric Bills. Prepared by Federal Power Commission.
15. Summary of Electric Service. Prepared by California Public Utilities Commission.
16. California Airports. Prepared by State Reconstruction and Redevelopment Commission (1947).

RESEARCH AND THE RESEARCH REPORT (Continued)

17. Research Report on the California Prison System. Prepared by
James C. Thompson (1955)
18. Research, Education and Development in the Prison System.
Prepared by U.S. Department of Labor (1950)
19. Research in California. Prepared by State Department of
Social Services (1951)
20. An Evaluation of the California Prison System. Prepared by
James C. Thompson. Prepared by Department of Corrections,
University of California (1951)
21. Prison Research. Prepared by J. Edgar Hoover (1951)
22. Research on the Prison System of California, 1941-1951.
Prepared by California Department of Social Services,
1951
23. Prison Research. U.S. Department of Labor

RESEARCH REPORT

1. 1950 Prisoners: Re-examination of Prison Statistics.
Prepared by National Social Science Council, for
Social Science Council
2. Prison Statistics and Research. Prepared by
James C. Thompson (1951)
3. Research in California. Prepared by State Department of
Social Services (1951)
4. Research in California. Prepared by State Department of
Social Services (1951)
5. Research in California. Prepared by State Department of
Social Services (1951)
6. Research in California. Prepared by State Department of
Social Services (1951)
7. Research in California. Prepared by State Department of
Social Services (1951)
8. Research in California. Prepared by State Department of
Social Services (1951)
9. Research in California. Prepared by State Department of
Social Services (1951)
10. Research in California. Prepared by State Department of
Social Services (1951)

REDEVELOPMENT AGENCY (Continued)

11. The Population of Western Addition A-2. Prepared by Project Service Co. (1962).
12. Land Utilization and Market Analysis. Prepared by Roy Wenzlick & Co.
13. Relocation in San Francisco-Western Addition Project. Prepared by Wallace Smith for the Bay Area Real Estate Research Committee (4th quarter 1960).
14. Market Analysis of Area "E" (Embarcadero). Prepared by Real Estate Research Corp.
15. Feasibility of Relocation of Business - Golden Gateway. Prepared by Western Real Estate Research Corp.
16. Study on Feasibility of Residential Rehabilitation (July 1962).
17. Commercial and Industrial Survey: (Parking Facility Supplement) (1963).
18. Diamond Heights Owners Participant Survey (1962).

DEPARTMENT OF CITY PLANNING

1. Downtown Isn't Doomed (1952).
2. Potrero Hill Neighborhood Improvement Study. (1955).
3. Skid Row: San Francisco (1956).
4. Specific planning area studies, 1958.
5. History of Land Values: San Francisco Real Property Survey (1955-56).
6. San Francisco Redevelopment Area "E" - A Report and General Development Plan. Prepared by City Planning Commission and San Francisco Redevelopment Agency.
7. Assessed Valuation of Central Business District (1951, 1956, 1961).
8. The Master Plan of San Francisco, 1945-46.
9. WPA Land Use Survey - San Francisco, preliminary report (1937).
WPA Land Use Survey - Block Summary
10. Budgeting the Land. Prepared by Bryant Hall (1944).
11. The San Francisco Bay Metropolitan Area (1948).
12. The Cost of Driving to Work (1957).

RECOMMENDED STUDY PROGRAM

1. The Evolution of the Indian National Movement (1900-1947)
2. The Indian National Movement and the Role of the Congress (1900-1947)
3. The Indian National Movement and the Role of the Muslim League (1900-1947)
4. The Indian National Movement and the Role of the British (1900-1947)
5. The Indian National Movement and the Role of the American (1900-1947)
6. The Indian National Movement and the Role of the Chinese (1900-1947)
7. The Indian National Movement and the Role of the Japanese (1900-1947)
8. The Indian National Movement and the Role of the Soviet Union (1900-1947)
9. The Indian National Movement and the Role of the United States (1900-1947)
10. The Indian National Movement and the Role of the European (1900-1947)
11. The Indian National Movement and the Role of the African (1900-1947)
12. The Indian National Movement and the Role of the Latin American (1900-1947)
13. The Indian National Movement and the Role of the Middle East (1900-1947)
14. The Indian National Movement and the Role of the Far East (1900-1947)
15. The Indian National Movement and the Role of the World (1900-1947)

RECOMMENDED STUDY MATERIAL

1. The Indian National Movement (1900-1947)
2. The Indian National Movement and the Role of the Congress (1900-1947)
3. The Indian National Movement and the Role of the Muslim League (1900-1947)
4. The Indian National Movement and the Role of the British (1900-1947)
5. The Indian National Movement and the Role of the American (1900-1947)
6. The Indian National Movement and the Role of the Chinese (1900-1947)
7. The Indian National Movement and the Role of the Japanese (1900-1947)
8. The Indian National Movement and the Role of the Soviet Union (1900-1947)
9. The Indian National Movement and the Role of the United States (1900-1947)
10. The Indian National Movement and the Role of the European (1900-1947)
11. The Indian National Movement and the Role of the African (1900-1947)
12. The Indian National Movement and the Role of the Latin American (1900-1947)
13. The Indian National Movement and the Role of the Middle East (1900-1947)
14. The Indian National Movement and the Role of the Far East (1900-1947)
15. The Indian National Movement and the Role of the World (1900-1947)

DEPARTMENT OF CITY PLANNING (Continued)

13. Obermann-Shippe-Proctor Report on Housing Characteristics, 1900-1953.
14. Summary of Past and Projected Population in San Francisco Bay Area to Saturation Population 5,000,000, 1860-2000.
15. Bulk Control Studies (1958).
16. 1952 Housing and Vacancy Survey.
17. Produce Area Survey (August 1955).
18. Relocation of San Francisco Wholesale Produce Market (1953).
19. Population and Housing Analysis: 1950-1960.
20. General Social and Economic Characteristics of San Francisco as Shown in 1960 Census.
21. An Activity Inventory for Downtown San Francisco, 1953-1961.
22. Summary of Population by Communities and Planning Areas, 1950-1960.
23. Ethnic Population Composition in San Francisco, 1949-1951.
24. Effects of Non-white Purchases on Market Prices of Residences. Prepared by Luigi M. Laurenti.
25. Population Trends by Area, 1930 to 1970.
26. The Negro Vote in San Francisco, 1940-48.
27. Central Business District Study - Inventory of Establishments (1953-1961).
28. Bay Area Shopping Centers - 1952.
29. Report of a Plan for the Location of Firehouses in San Francisco (1952).
30. Housing and Neighborhood Conditions in San Francisco, 1955.
31. Dwelling unit count - 1948 and 1962.
32. Improvement Investment Study in Central Business District, 1946-1961.
33. Market Re-Analysis of Redevelopment Area "E". Prepared for City Planning Commission by Western Real Estate Research Corp. (1958).

SAN FRANCISCO HOUSING AUTHORITY

1. Plan of Development Program for Low-rent Housing, 1940-1963.
2. A Study for Purchase, Rehabilitation, and Eventual Sales of Existing Structures for Low-income Families. Preliminary report to the Housing Commission (January 1961).
3. Family Income and Rent Survey, 1955.
4. The Need for Housing in San Francisco, 1946.
5. Survey of Tenants in War Housing, 1953.

BAY AREA RAPID TRANSIT DISTRICT

1. Transportation Plan for San Francisco (November 1948).
2. San Francisco Marin Crossings, 1962.
3. Dolwig Report, "Relief of Congestion on Transbay Crossings" (1949).
4. Report on a Plan for Rapid Transit in San Francisco Consonant with Bay Area Rapid Transit System . Prepared by Transportation Technical Committee, BARTD (May 1960).
5. Transbay Traffic Study by Division of San Francisco Bay Toll Crossing, November 1962.
6. Twenty-four Hour Origin between 97 Districts. Prepared by Parsons, Brinkerhoff (1954).
7. Traffic Analysis and Projection, Vol. II. Prepared by Golden Gate Bridge Authority (May and October 1959).
Preliminary Report - Long Range Planning, Vol. I.
8. Estimated Effects of Transit System on Bridge Traffic in 1975-76.
9. A Report to the Department of Public Works on Additional Toll Crossings of San Francisco Bay.
10. Cordon Count Data, Metropolitan Traffic District. Study by DeLuew-Cather (1947).
11. Cordon Count Data - San Francisco Metropolitan Traffic District. Study by DeLuew-Cather (July 1959).
12. Rapid Transit Plan for San Francisco and San Mateo Counties, 1961.
13. Comparison of Proposed Rapid Transit Routes - 1961.
14. Senate Interim Committee on Rapid Transit in San Francisco Bay Area, 1956.
15. Opinion Leader Survey on Rapid Transit. Prepared by Facts Consolidated (August 1959).
16. Ballot Box and Public Opinion Poll (Rapid Transit). Prepared by Penfield & Associates (August 1962).
17. "Transportation Problems in San Francisco", Urban Land (1955).
18. Relationship of Regional Rapid Transit to Decentralization and Central Core City - 1959.
19. Regional Rapid Transit for San Francisco Bay Area. Prepared by Parsons, Brinkerhoff (April 1954).
20. Trends in Economic Activity and Transportation in San Francisco Bay Area by David A. Reuzan, Real Estate Research Program, University of California (1954).

BAY AREA RAPID TRANSIT DISTRICT (Continued)

21. Economic Aspects and Effect upon Bay Area of Proposed Transit System. Prepared by Ebasco Services (1959).
22. Projected Growth of Bay Area. Prepared by Van Beuren, Stanborg, and Parsons, Brinkerhoff.
23. Present and Projected Population of San Francisco According to Bay Area Motor Transit Segments, 1950 to 1975.
24. Report on Property Tax Resources and Associated Subjects, 1933-1959. Prepared by Stone and Youngsberry.
25. Traffic Report by Metropolitan Area (June 1949).

DEPARTMENT OF PUBLIC WELFARE

1. A New Family Rehabilitation Program (1961).
2. Rehabilitation for Independence (1962).
3. Social and Economic Characteristics of Aid to Needy Children Families, State Research Series #17, March 1960.
4. Monthly Statistical Report of All Welfare Programs and Services.
5. Statistical Summary of Public Welfare in California, 1963.
6. Significant Facts about ANC Residents in California, 1957.
7. Selected Social Characteristics of Blind Aid Recipients in San Francisco County, 1956.
8. Preliminary Report: Housing Survey of Family Indigent Aid Group, 1959.

CONTROLLER

1. Mayor's Transmittal of Consolidated Budget Estimates for All Departments and Offices of, and the Proposed Budget for, San Francisco, 1932 to 1963.
2. Budget Estimate for Fiscal Year: Part I: Schedules of Explanations for Proposed Increase or Decrease as Compared with Previous Fiscal Year; Part II: Schedule of Proposed Work Programs.

DEPARTMENT OF PUBLIC HEALTH

1. National Air Sampling Network: San Francisco-Meteorological Data 1954-1963.
2. Condemnation of Dwellings. Sample report, 1959-1963.
3. Telegraph Hill Survey, January 1962.

APPENDIX B: SELECTED BIBLIOGRAPHY (continued)

17. Technical Assistance and Advice from the United States
Bureau of Economic Affairs, 1957.
18. Technical Assistance to the United States
and Bureau, 1957.
19. Technical Assistance to the United States
and Bureau, 1957.
20. Technical Assistance to the United States
and Bureau, 1957.
21. Technical Assistance to the United States
and Bureau, 1957.
22. Technical Assistance to the United States
and Bureau, 1957.
23. Technical Assistance to the United States
and Bureau, 1957.
24. Technical Assistance to the United States
and Bureau, 1957.
25. Technical Assistance to the United States
and Bureau, 1957.

APPENDIX C: SELECTED BIBLIOGRAPHY

1. Technical Assistance to the United States
Bureau, 1957.
2. Technical Assistance to the United States
Bureau, 1957.
3. Technical Assistance to the United States
Bureau, 1957.
4. Technical Assistance to the United States
Bureau, 1957.
5. Technical Assistance to the United States
Bureau, 1957.
6. Technical Assistance to the United States
Bureau, 1957.
7. Technical Assistance to the United States
Bureau, 1957.
8. Technical Assistance to the United States
Bureau, 1957.
9. Technical Assistance to the United States
Bureau, 1957.
10. Technical Assistance to the United States
Bureau, 1957.

APPENDIX D: SELECTED BIBLIOGRAPHY

1. Technical Assistance to the United States
Bureau, 1957.
2. Technical Assistance to the United States
Bureau, 1957.
3. Technical Assistance to the United States
Bureau, 1957.
4. Technical Assistance to the United States
Bureau, 1957.
5. Technical Assistance to the United States
Bureau, 1957.
6. Technical Assistance to the United States
Bureau, 1957.
7. Technical Assistance to the United States
Bureau, 1957.
8. Technical Assistance to the United States
Bureau, 1957.
9. Technical Assistance to the United States
Bureau, 1957.
10. Technical Assistance to the United States
Bureau, 1957.

APPENDIX E: SELECTED BIBLIOGRAPHY

1. Technical Assistance to the United States
Bureau, 1957.
2. Technical Assistance to the United States
Bureau, 1957.
3. Technical Assistance to the United States
Bureau, 1957.
4. Technical Assistance to the United States
Bureau, 1957.
5. Technical Assistance to the United States
Bureau, 1957.
6. Technical Assistance to the United States
Bureau, 1957.
7. Technical Assistance to the United States
Bureau, 1957.
8. Technical Assistance to the United States
Bureau, 1957.
9. Technical Assistance to the United States
Bureau, 1957.
10. Technical Assistance to the United States
Bureau, 1957.

DEPARTMENT OF PUBLIC WORKS, BUILDING INSPECTION

1. Report on Planned Area Inspection Program, Conservation Areas, 1961.
2. City-wide Urban Renewal Plan, 1959.
3. Survey of Converted Structures by Census Tracts (Spring 1959).
4. Schaaf Report on Rehabilitation Costs (1959).
5. Conversion Survey Summary by Community Areas (February 1959).
6. Residence Survey Report in Four Special Study Areas (Fall 1959).

DEPARTMENT OF PUBLIC WORKS, BUREAU OF ENGINEERING

1. Report on the Development of McLaren Park, June 1959.
2. San Francisco Burnt Districts, 1906.
3. Improved Areas (March 1941).
4. Hydrographic Surveys, 1934.
5. Complete Aerial Photo - City Surveys (1938, 1943, and 1959).

DEPARTMENT OF PUBLIC WORKS, TRAFFIC ENGINEERING

1. Report to Parking Authority on Proposed Public Garages (September 1950).
2. Report to Parking Authority on Downtown Parking (February, 1954)
3. Parking reports from outside organizations on various downtown areas, 1956-1957. Prepared by Gould, Ferguson, Ramp, DeLeuw.
4. The Parking Authority's San Francisco Parking Program, 1954.
5. Parking Supply and Demand in Downtown San Francisco, November 1948.
6. Report to Parking Authority on Nob Hill parking survey, November 1953.
7. Report to Parking Authority on Proposed Garages in Redevelopment Area "E", January 1959.
8. "Report to Parking Authority on Neighborhood Shopping District Parking Program", September 1959, Report No. 2, May 1961.
9. Parking Meter Rate Evaluation Study, May 1958.
10. Trafficways in San Francisco (November 1960).
11. Status of Freeways in San Francisco, 1959.
12. San Francisco City-wide Traffic Survey - WPA report, 1937.
13. San Francisco Origin and Destination Survey, 1943.
14. Traffic report of the San Francisco Bay Metropolitan Area, 1949.
15. Rapid Transit for San Francisco - Monorail Elevated Subway, A Report of Possibilities, 1952.

REPORTS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

1. Report on the Survey of the Agricultural Situation in the United States, 1924
2. Report on the Survey of the Agricultural Situation in the United States, 1925
3. Report on the Survey of the Agricultural Situation in the United States, 1926
4. Report on the Survey of the Agricultural Situation in the United States, 1927
5. Report on the Survey of the Agricultural Situation in the United States, 1928
6. Report on the Survey of the Agricultural Situation in the United States, 1929

REPORTS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

1. Report on the Survey of the Agricultural Situation in the United States, 1930
2. Report on the Survey of the Agricultural Situation in the United States, 1931
3. Report on the Survey of the Agricultural Situation in the United States, 1932
4. Report on the Survey of the Agricultural Situation in the United States, 1933
5. Report on the Survey of the Agricultural Situation in the United States, 1934

REPORTS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

1. Report on the Survey of the Agricultural Situation in the United States, 1935
2. Report on the Survey of the Agricultural Situation in the United States, 1936
3. Report on the Survey of the Agricultural Situation in the United States, 1937
4. Report on the Survey of the Agricultural Situation in the United States, 1938
5. Report on the Survey of the Agricultural Situation in the United States, 1939
6. Report on the Survey of the Agricultural Situation in the United States, 1940
7. Report on the Survey of the Agricultural Situation in the United States, 1941
8. Report on the Survey of the Agricultural Situation in the United States, 1942
9. Report on the Survey of the Agricultural Situation in the United States, 1943
10. Report on the Survey of the Agricultural Situation in the United States, 1944
11. Report on the Survey of the Agricultural Situation in the United States, 1945
12. Report on the Survey of the Agricultural Situation in the United States, 1946
13. Report on the Survey of the Agricultural Situation in the United States, 1947
14. Report on the Survey of the Agricultural Situation in the United States, 1948
15. Report on the Survey of the Agricultural Situation in the United States, 1949
16. Report on the Survey of the Agricultural Situation in the United States, 1950

DEPARTMENT OF PUBLIC WORKS, TRAFFIC ENGINEERING (Continued)

16. Report on the Rehabilitation of the San Francisco Muni Railway from 1947-1957.
17. Stonestown Shipping Center - Parking Study, 1961.
18. Postwar Transit Plan for Muni Railway for San Francisco, 1945.
19. History of Public Transit in San Francisco, 1850-1948.
20. Report on Transportation Facilities in San Francisco, 1913.
21. San Francisco Improved, 1935-1939. Prepared by Clyde Healy, Assistant City Engineer, and WPA coordinator.

WATER DEPARTMENT

1. Cost and Rate Analysis (1958).
2. Rate Schedule for Hetch-Hetchy Power as Established by PUC, 1947-1950.
3. Proposals for a Survey of Management and Operational Problems. Prepared by G. S. May Co. (1956).

STATE DEPARTMENT OF EMPLOYMENT

1. Study of Bay Area Labor Market, 1956.
2. External Markets of San Francisco-Oakland Metropolitan Area Economy (October 1960).
3. "Employment and occupational trends in San Francisco-Oakland Area, 1950-1960", Labor Market Information Bulletin #6.
4. The Economic Status of Negroes - San Francisco-Oakland Area (May 1963).
5. San Francisco County Census Areas - Estimated Total Employment by Industry and Census Area, 1958.
6. Labor Supply and Demand Reports in San Francisco-Oakland Labor Market Area.
7. Identification of Surplus and Shortage Occupations, October 1961.
8. San Francisco-Oakland Labor Market Report (Monthly).
9. Community Labor Market Surveys (Selected years, 1950-1963).

STATE DEPARTMENT OF INDUSTRIAL RELATIONS

1. Facts on Non-white Persons, 1960.
2. California Labor Statistics Bulletin (1924 to 1963).
3. California Statistical Abstract (1939-1963).

STATE DEPARTMENT OF INDUSTRIAL RELATIONS (Continued)

4. Growth of Population - Bay Area. Prepared by Bureau of Agricultural Economy (1944).
5. Basic Information on Race and Nativity (San Francisco). Prepared by Bureau of Agricultural Economy, 1943.
6. Non-Agricultural Wage and Salary Workers in California (Prepared monthly).
7. Employment and Unemployment in California (Prepared monthly).
8. Mortality and Business Turnover in California.
9. California Industrial Relations Report (Yearly survey).
10. Effect of a Change in Taxable Wage, 1959.
11. Pension Plans in California Collective Bargaining Agreements, 1950-1961.
12. Health and Welfare under Collective Bargaining: San Francisco Bay Area. Prepared by Federated Employers of Bay Area.
13. Health and Welfare Plan (Yearly survey).
14. Report on Employment, Payroll, and Hours (Prepared monthly).
15. Work Stoppages in California (Yearly survey).
16. Study of California's Tax Treatment of Manufacturing Industry, 1961. Prepared by California Economic Development Agency.
17. Women workers in California, 1957.
18. Joint Wage and Salary Survey. Prepared yearly by Bay Area Salary Survey Commission.
19. Union Labor in California (Yearly summary).
20. Survey of Office Salaries - San Francisco Bay Region. Prepared yearly by Federated Employers of Bay Area.
21. Union Pay Rates and Supplemental Benefits in Selected Agreements, Bay Region, 1957.
22. Salary and Working Conditions: Survey Report on California Cities. Prepared yearly by League of California Cities.
23. Average Earnings and Hours - San Francisco County (1949 to 1963).

Arthur D. Little, Inc.

GOVERNOR'S ADVISORY COMMISSION ON HOUSING PROBLEMS

1. Background Information on Costs of Land for Single-Family Housing. Prepared by Sherman Maisel (1962).
2. Community Effects: Relocation of Peoples and Homes from Freeway Rights of Way. Prepared by Rudolf Hess, California Division of Highways (1962).
3. The Role of Mobile Housing in California. Prepared by Frank Mittlebach (1962).
4. Housing Trends and Related Problems in California. Prepared by D. Foley, W. Smith, and C. Wurster (1962).
5. Housing Deficiencies of Agricultural Workers and Other Low Income Groups in Rural and Urban Fringe Communities. Prepared by Division of Housing, Department of Industrial Relations, directed by Oliver McMillan (1962).
6. Report on Housing in California (January 1963).
7. Rental Units and Households in Recent San Francisco Multi-family Construction, January 1959-June 1962. Prepared for National Housing Conference and Eichler Homes, Inc., by Project Service Co.
8. Extent of Dislocation Resulting from Renewal Projects. Prepared by Marshall Kaplan (1962).
9. An Appraisal of Mobile Home Living. Prepared for Trailer Cooch Association by James Gillies (1960).
10. Housing for California's Senior Citizens. Prepared by Frank Mittelbach (1962).
11. Financing of Non-farm Housing in California. Prepared by James Gillies and Leo Grebler (1962).
12. Control of Land Development and Urbanization in California. Prepared by John Dyckman (1962).
13. State Policy on Discrimination in Housing. Prepared by Marshall Kaplan (1962).

Technical Memorandum #2

COMMUNITY RENEWAL PROGRAMMING MODEL

Our efforts to develop a framework for approaching San Francisco's Community Renewal Program have proceeded on the basis of certain fundamental premises regarding the nature and scope of the renewal process. Of significance, for example, is the fact that we define urban renewal broadly, as constituting the total of all public and private actions which must be taken to provide the continuous sound maintenance and development of an urban area.

Furthermore, we believe that the fundamental objective of the Community Renewal Program is its programming function, that is, the establishment of a schedule of actions, both private and public, on a time-phased basis to constitute the community's future renewal efforts. In short, the objective is to indicate the type of renewal actions required, the initiators, the location and the timing.

In order to carry out the objectives of the Community Renewal program, in particular its programming function, it is necessary that the city be viewed as a system of interrelated activities. But the city is a complex system, and the urban land market is made up of many participants, each seeking the best possible individual position. Consequently, a method must be developed which will offer a continuous check on the state of the system and which can be manipulated to test the consequences and repercussions of alternative policies.

There is need for some kind of framework of growth and development in which the effects of actions by one group of "actors" in the city on other "actors" can be evaluated and measured. The absence of such a framework is largely responsible for the weaknesses and difficulties encountered in renewal programs in the past: those responsible for the decisions with respect to renewal could not anticipate the repercussions or consequences of their actions.

One reason, no doubt, for this situation has been the lack of (or perhaps the lack of familiarity with) suitable scientific methods. Recently developed methods, variously known as "operations research," "systems engineering," or "systems analysis and design," offer a method of structuring a problem in terms of the systems concept.

COMPARATIVE ANALYSIS OF THE

The object of this study is to compare the development of the human brain from birth to maturity. It is a study of the changes in the size, shape, and weight of the brain, and of the changes in the rate of growth. It is a study of the changes in the structure of the brain, and of the changes in the function of the brain. It is a study of the changes in the development of the brain, and of the changes in the development of the body.

It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body.

It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body.

It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body.

It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body. It is a study of the changes in the development of the brain, and of the changes in the development of the body.

A. THE SYSTEMS CONCEPT

The systems concept emphasizes that there is an end objective to every system and that the attainment of this objective is more important than achieving small triumphs in individual operations that contribute to, but do not make up, the whole objective. For example, if the objective of an urban renewal program is to improve the quality of housing available to all income groups in the city, then achievement of this objective must not be sacrificed to the successful improvement in the supply of housing available in one section of the city, or available to one income group.

The systems concept also emphasizes that each component in a system is affected by, and related to, the component on either side of it, and that this inter-relationship between all components in the system determines the success or failure of the system. Systems can be very complex or very simple, but each element in the system is dependent upon other elements, and all must be in harmony to achieve a common objective. For example, the quality of housing available to income groups in the city is affected by such related components of the system as transportation, income stratification and family composition, expectations of investors, industrial health, etc. Furthermore, the component elements of the system must be capable of being given mathematical expression.

The way in which the elements of the system act upon one another will be determined by painstaking investigation and by drawing upon theories of economic and social behavior. In economics and other social (and physical) sciences, such complex systems are typically represented by the use of mathematical models. *core elements must first be determined*

A model is developed by examining the relationships among various factors considered to be important in influencing the workings of the total system. Some models are expressed best graphically, some verbally. When the relationship can best be expressed through numbers, the system is represented by a mathematical model. By expressing the quantified relationships between a set of interrelated factors, a mathematical model affords a simplified and manageable picture of the workings of the total system. A model is designed in such a way that if a change is made in one or several of its component factors, the resulting effect on the total picture can be measured.

Prior to the development of high-speed electronic data processing equipment, most systems analyses were limited to the study of relatively simple systems, for which closed analytical solutions could be obtained concerning input-output relationships and component interrelationships. In recent years, technical capabilities for analysis have been greatly expanded by increasing ability to conduct simulation-type operations, which permit highly complex systems to be studied. Thus, systems such as the urban land use market are now potential subjects for study using these techniques.

B. OBJECTIVES TO BE CONSIDERED

Before considering our specific approach to analysis, it is necessary to carefully delineate the objectives of both the system under study and of the study mechanisms themselves, since these objectives should have strong influence on the form of the model. We are, in fact, concerned with several sets of objectives:

1. The Objectives of the System

The information developed by the model will be primarily useful if it allows city planners and other appropriate public officials to make better decisions and take specific actions which will contribute to the long-term goals of the Community Renewal Program, and enables the city to get maximum efficiency from every dollar spent on community improvement. That is, the analysis must be user action-oriented, in terms of the policies, investment, zoning and other factors that can be changed or influenced by the city.

2. The Objectives of the Function to which the Analysis will Contribute

The general purpose of the analytical techniques with which we are concerned is to assist in developing an improved renewal program. This mainly involves changes in the city's land use and physical plant. It is thus appropriate that the analytical model be structured in economic terms, and particularly in terms of private and public capital investment.

3. The Objectives for Which an Analytical Model may be Employed

Analytical techniques or models will not, and should not, provide the complete answer concerning community renewal decisions. The model is at best a tool, which should be used in conjunction with other tools, including the experience and judgment of the planning department, the goals and objectives of the city's long-range Master Plan, etc.

Historically, models have found use for at least four different types of purposes. These include:

a. Helping to structure thinking and to guide the planning of research and evaluation

A model is often of value when conducting a research or evaluation program, simply through indicating the structure of the problem under study. A model can fill this role prior to being operational. During the design phase, it can often serve to orient research, to eliminate irrelevant, although interesting, avenues of study, and to point up critical areas which must be understood if the program is to be successful.

b. Providing insight concerning the manner in which system components interact, and concerning the pattern of cause and effect in over-all operations.

In this role, a simple operating model can assist in developing general understanding and comprehension of the system under study without necessarily providing definitive, quantitative results.

c. Testing and evaluating specific proposed plans.

In performing this function, models can be employed to determine the cost and end-effectiveness of specific proposed potential plans. The results can then be combined with other factors important to over-all evaluation to reach a final decision concerning the proposed changes. A more complex model with more detailed relationships is necessary for this purpose.

d. Seeking to improve the over-all system through evaluation of a large number of possible changes or plans

This final purpose involves use of a model as a means for determining optimum allocation of resources within the system under study. In this case, the model must be able to analyze a wide variety of possible changes. Within suitable constraints, those combinations can be selected which lead to the optimization of a designated payoff function or set of objectives.

The complexity of a specific model should be closely related to its purpose. Effective guidance of research plans can often be obtained with a relatively crude model design, while for either detailed or broad evaluations of plans, far more complexity and accuracy should be built into the systems analysis. Historically, models of complex systems have contributed to the first two of the above goals far more often than to the last two, although this fact is not always recognized publicly.

C. HISTORY

To date, models have not been used either in city planning or for developing renewal programs, although work in related fields has held promise that models are possible. Early work in the urban field led to the development of theories such as the concentric theory, the sector theory, and the poly-nucleated theory to explain the growth of cities. These theories, however, did not tell what would happen if things changed.¹ Early academic research did not have to answer policy questions.

¹ For a review of these theories and their shortcomings, see Britton Harris' paper, "Some Problems in the Theory of Intra-Urban Location," prepared for a seminar discussion under the auspices of the Committee on Urban Economics of Resources for the Future, held in Washington, D.C., April 6-8, 1961.

Transportation research opened new areas. As transportation specialists sought to estimate traffic volumes at interchanges and the traffic that various land uses tended to generate, they required origin and destination data and were in a position to extend the amount of information gathered. For the first time, it was possible to explore the use of data processing techniques in planning. The Detroit Area Transportation Study tried to explore this technique, but much of the data gathered in that study was unused (and may be unusable) because of a lack of understanding of the land system. The Chicago Area Transportation Study did better in this respect, but this study did not really address itself to the planning requirements. For example, the study foreclosed on the question of what happens to downtown Chicago vis-a-vis the suburbs.

One of the pioneering efforts in model building for metropolitan planning purposes has been the Penn-Jersey Transportation Study. The objective of this study has been the establishment of a plan for the future development of a transportation system for the metropolitan area around Philadelphia. In pursuing this objective, the Study has been based on several unique approaches.¹ One of these is that for the first time, a study of this type has attempted to allow for the fact that not only do existing land-uses establish the requirements for a transportation system, according to their trip-generating characteristics, but the existence of a particular transportation system will also affect future land-use determinations. Therefore, the Study has attempted to simulate several alternate future land-use configurations as the outcome of alternative proposed transportation systems. These will then be submitted to the appropriate governmental officials to guide them in their transportation policy determinations. In this regard, the Study is putting emphasis on the policy aspect of transportation decisions, which represents another departure from traditional transportation studies.

The design of the Penn Jersey simulation model has another unique feature: it is essentially a behavioral model² and therefore an explanatory model, something rare for transportation studies, which have usually been statistical or descriptive. The Penn-Jersey approach has highlighted the need for better predictive instruments for city planning and urban renewal purposes, but there is no behavior theory to provide the needed detail.

National income models are not behavioral models, but accounting relationships. The Detroit study used a gravity model, relating land valuation to density and distance, but this type of model did not permit the prediction of the results of arbitrary changes in the city. Attempts are now being made to build micro-models with decision-making units as the components. Generally, however, no allowance is made for government decisions which are considered as exogenous variables; only endogenous variables, such as the relationships of the decision-making units are being considered.

¹ See John V. Gifford, Jr., "The Urban Information System as a Research Tool," presented at the Joint Annual Meeting of the Operations Research Society of America and the Institute of Management Sciences, Berkeley, Calif., April, 1963.

² See p. 6 following.

There have been a few models described in the literature that have been developed to help predict metropolitan residential development. These have focused mainly on suburban residential development and on the effect of rent-paying ability, residential population characteristics, densities, etc. For example, Alonso¹ has outlined a theoretical model which related land values and bid-rent relations to the distance, and thus transportation cost, to the market or center of the city. Kain and Meyer² at the Rand Corporation and Herbert and Stevens³ of the Penn-Jersey study have developed computer "behavioral" models for the distribution of households to residential land; both models are designed to be part of larger models which will study the interrelationships between transportation and land-use activities. Hansen⁴ has described several empirical models for studying metropolitan residential extension - "new occupancy of intrametropolitan open sites by urban housing during specified time periods." Other models have been utilized to predict traffic flows.

These models have not shed light on many aspects that are important for urban renewal planning:

- (1) The interaction and competition for land of residential housing with other forms of land use, as within a metropolis.
- (2) The competition and interaction with other forms of investment.
- (3) What policies and actions, aside from investment in transportation facilities, the city can utilize to encourage long-term desirable changes in land-use and building stocks.

In our work we intend to draw on the previous work, however, where appropriate, to aid in construction of submodels and development of concepts.

In the following section, we outline a model which gives promise of proving to be a useful tool in preparing San Francisco's Community Renewal Program. The outline of the model has already proved useful in helping structure our entire research project and component analyses.

-
1. William Alonso, "A Theory of the Urban Land Market," Papers and Proceedings of the Regional Science Association, Vol. 6, 1960.
 2. J. R. Kain and J. R. Meyer, "A First Approximation to a Rand Model for Study of Urban Transportation," The Rand Corporation Memorandum RM-2878-FF, Nov. 1961.
 3. John D. Herbert and Benjamin H. Stevens, "A Model for the Distribution of Residential Activity in Urban Areas," Journal of Regional Science, Vol. 2, No. 2, 1960.
 4. Willard B. Hansen, "An Approach to the Analysis of Metropolitan Residential Extension," Journal of Regional Science, Vol. 3, No. 1, 1961.

D. THE SAN FRANCISCO COMMUNITY RENEWAL PROGRAMMING MODEL

For purposes of developing San Francisco's Community Renewal Program, we have chosen an "equilibrium-seeking" model that conceives of the renewal process as one that attempts to balance the supply of demand for space. The model permits a relatively simple structure of accounts to be set up describing the City's stocks of space, including the supply of land, structures and other physical improvements, such as parks, schools, etc. They also describe the users of, and investors in, this space, (i.e., the "actors"), including households, business establishments, savings banks, government agencies, etc. Any departure from equilibrium is reflected in pressure for change in the amount of or quality of space. The principal mechanism of change, and the chief force in altering pressure, is investment.

The nature and kind of investment should only be viewed as a symptomatic indicator of the state of the market

This focus on investment is based on our view that urban renewal is chiefly a set of investment decisions and actions--both private and public. In fact, we view any decision which results in a change in asset value as investment (or "disinvestment"). For this reason, renewal programs throughout the United States have been concerned ultimately with changes in physical assets, often to the neglect of the role that investment plays in the process. The model selected for this program seeks to recognize the role of investment in the renewal process.

The renewal process, as reflected in the model, undergoes a change when the users of space--because of an increase in the number of users or a change in users' tastes or an increase in the ability to pay--create a demand for space that results in a space pressure, that is, a demand for certain types of space that exceeds the available supply. The advent of space pressure causes rents to rise.

The model is also based on the existence of a variety of investors who are seeking to establish priorities for their investment funds, with the highest priority going to those opportunities for which there appears to be the greatest demand commensurate with an ability to pay. As the model is conceived, the existence of a space pressure--and a concomitant increase in space rent--will lead to investment in this type of space if higher priority demands have not fully absorbed available investment funds.

Allowance is made in the model for the introduction of important and appropriate public actions--zoning restrictions, public subsidies, taxes, etc.

As the model is currently conceived, pressure for various types of space throughout the city will be identified and ranked in order of decreasing pressure. In arriving at a measurement of pressure, the model first calculates the total "demand" for different kinds of space--residential, commercial, industrial, institutional--that are desired by the city's users during the time period under consideration. This demand is then compared with the stocks of space existing at the beginning of the period. An imbalance between demand for and stock of a particular type of space is then converted into a pressure for that type of space.

The model then examines the various available possibilities of relieving this pressure (that is, of making the desired "transitions")--new construction, conversions, rehabilitation--in accordance with the zoning laws. The cost of each possibility is considered, including, for example, the cost of land purchase, demolition, and clearance (if required); the actual cost of construction, taking into account any special topographic features which may affect construction; and any cost to the city of providing additional facilities or amenities (such as parks or utilities) to facilitate the transition.

The cost of relieving the pressure will be ranked in increasing order of cost. The model assumes that the transition that can be effected at the least total cost will first be used to satisfy the demand that has created the imbalance, if there is sufficient rent-paying ability on the part of the potential users and if public and private funds are adequate to create the stocks.

The model thus proceeds on the basis of satisfying the pressures for space in the most economic manner, until either the imbalance in demand for each type of space is satisfied or the funds available during the period are used up. Any funds not utilized are assumed to be carried over to the next time period, where appropriate.

Thus, as presently conceived, the model will consider, for discrete time intervals in sequence, changes in space pressure, the relief of such pressure, and the effect of these changes on the total system. The time interval over which these changes take place must be long enough for the physical transitions under study to be completed. By this, we mean that the time period is sufficient to complete the physical aspects of a redevelopment project, the building of an industrial facility, or the construction of a high-rise apartment building. This implies that time units of perhaps two years in length should be employed, although the precise time interval for iteration remains to be determined. We may find, for example, that it is desirable to allow for a period during which property is in a "frozen" condition, that is, slated for action, but action cannot yet occur, as might be the case in a redevelopment project when property has been acquired, but clearance and new construction cannot begin until all of the required property can be assembled.)

During a given time period, the following steps will take place:

1. Information on a variety of exogenous factors will be updated, including the effect of feedback changes that may have occurred in earlier time periods. Among the exogenous factors will be population, income, tax rates, etc.
2. Consideration will be given to the effect of changes in the exogenous factors (and backlog conditions) on demands for space of different types.
3. In accordance with a set of logical rules, the transitions in land use which might take place to satisfy the indicated demands during the time periods will be determined.
4. The resources available to make such transitions will be examined.
5. The transitions which are feasible will be selected and made.
6. Readjustments will be made in parameter values to reflect the transitions.

The next time period will then be considered. The process will be repeated until the over-all period being studied (probably 20 years) has been covered.

Two types of information are examined by the model. The model is provided with input information (forecasts) on such matters as population, income tax rates, zoning policies and city renewal policies, by time period. These exogenous variables are determined mainly by conditions outside of the model (such as the general growth of the California economy and of the Bay Area) and by policies which are set by the City.

Internal to the model are a series of relationships that will have been established and which will calculate the effect of changes. Where there is a relationship--"feedback"--that can be established between the exogenous variables and the internal variables, the relationship will be used to modify the original forecast. For example, the forecast of population (total numbers and type) of San Francisco a decade hence may well depend on the kind of residential housing that has been constructed or made available by that time. If there is insufficient housing for one type of income family, then the forecast of that population segment would have to be altered. Likewise, the amount of private investment funds available to support changes in stocks of space may depend upon the rates of return, the tax rate, or other city policies. Where such relationships can be determined precisely enough they will be incorporated in the model. As yet, no such feedback relationships have been incorporated.

Before discussing the model in detail, it is important to note several assumptions and simplifications. Our central concern in this study is the condition or "state" of the City's space-use system. The central element of our over-all procedure is a mathematical model which can forecast the future state of the system at various points in time, based on a number of alternative assumptions about public policy, economic growth, technology, institutional arrangements, available investment funds, individual aspirations and tastes, etc. Thus, a number of possible alternatives in Community Renewal Programs may be introduced into the model, and the model will forecast the way they, in conjunction with all related non-public forces, would change the space-use system. Related to each alternative Community Renewal Program, the model will forecast the future "state" with respect to such factors as land use mix, dwelling unit mix, required public expenditures, tax yields, social patterns, etc.

The model will not itself evaluate or pick the best, or optimal, Community Renewal Program the City should follow--that is, it will not put a value on different uses of space or their users. Responsibility for such evaluation is political and cannot be assumed by research. It is intended that the City government will establish certain tentative goals and objectives for the future. These will be translated into measurable criteria which will form a systemic evaluative mechanism to be applied to the model's "output" (the consequences of each alternative for the future state of the space-use system). Each set of alternative consequences (associated with a different future state) will be "matched" against the goals-and objectives-criteria. The one which produces the closest fit will be rated highest, and the Community Renewal Program alternative which went into the model to create it will be accepted as the initial recommended program for the City. *not so* *big the v* *natural a* *market*
 It if is desired, alternative goal structures and criteria can be established and the different sets of consequences associated with different future states can be evaluated by each of them. Thus, the operation of the model, in conjunction with an evaluation mechanism, will tell us which set of public policies has the highest probability of effectiveness in actually reaching any given set of goals.

The designing of a model of this type requires that compromises be made between cost and practicality (including data collection) and detail. In the proposed model, the aim will be to select a land unit of sufficient size to minimize the number of items to be handled, but not so large as to wipe out differences in detail that are essential. A special study will be required to select the precise land unit--city block, census tract, enumeration district. Three criteria will be involved in arriving at the determination: data availability, homogeneity, and the relationship between the space type unit and the user type unit. The actual unit to be manipulated in the model will be small percentages of the basic unit, but they will not have specific geographic locations within the basic unit. In other words, it will be possible to specify--in percentage terms--the land use to which a basic unit is being put, but it will not be possible to locate geographically those individual units which are being used for industrial purposes, residential purposes, etc.

In its present form, the model achieves simplicity by not relating the land users directly to the specific piece of land they will be occupying. In fact, the model will not provide an over-all statement of the land use applicable to specific categories of users. Instead it provides only relationships concerning the availability of land in a specific state of use and condition, relative to the normal demand by all users for land of that type. One of the possible refinements of the model to be investigated is the feasibility of relating special categories of users to their applicable land uses.

?
what's the difference?

Of greatest significance, for purposes of the research program, is the fact that the model selected for further investigation is a loosely coupled dynamic model that makes possible the introduction of special relationships--or provides a way of minimizing the effect of certain very difficult relationships--as research proceeds.

1. Definitions of Main Storage Elements

In the model, there will be treatment of Individual Land Units, Land Tract Units, and User Units, to permit a characterization of supply and demand of space and a summation of the over-all relationships. The detail that is planned for each type of unit is discussed below.

During the discussion, the following notations are used:

Subscripts

- i will normally refer to specific user-types.
- j will normally refer to specific space-types.
- l will normally refer to locational categories.
- n will normally refer to land unit index numbers.
- m will normally refer to land tract index numbers.

Other

- Lower case letters will normally refer to characteristics of individual units (land or user).
- Capital letters will normally refer to summed quantities, often in vector form.
- Barred quantities will refer to normal or standard values.
- The subscript o will normally imply a base value of some sort.
- Primed values will normally refer to a potential future condition.
- The letter f will normally represent a--as yet unspecified--functional relationship.

a. Individual Land Units

Land units will constitute a convenient fraction of the basic land tract unit (e.g., planning area, "neighborhood", census tract, or enumeration district). Information will be collected and stored at the following level of detail for each land unit.

Identification

1. Basic land tract unit number (e.g., Census Tract Number).
2. Unit number - n.
3. Per cent of basic unit which land unit represents.

Basic Characteristics

4. Topography category.
5. Zoning category.
6. Policy control category.

Current Use

7. Type of use (Land Use, e.g., residential, commercial, etc.).
8. Condition (e.g., New - Good or Reconditioned - Standard - Substandard - Slum).
Note: A single code may be used to specify the combined type usage and condition.
9. Number of time periods in this condition.
10. Basic rental for this type of land use/condition = $r_{o,j}$
11. Locational category, ℓ , including allowance for availability of the land unit to transportation, community facilities, utilities, etc. (See discussion below under "Land Tract Units".)

Data will be summed over all units in the city, by land unit type.

12. The sum of all land units available of type/condition $j = S_j$.
13. The sum of all rental for land units of type/condition j is:

$$R_j = \sum_i S_j r_{ij}$$

*no such thing as r_{ij}
where defined*

It is expected that space type use/condition/location will be used instead of merely type use/condition. Then,

$r_{o,j}$ becomes $r_{o,j\ell}$

r_{ij} becomes $r_{ij\ell}$

$S_{j\ell}$ is used instead of S_j

If S_j is to be used for any purpose, then,

$$S_j = \sum_{\ell} S_{j\ell}$$

$R_{j\ell}$ is used instead of R_j

If R_j is to be used for any purpose, then,

$$R_j = \sum_i \sum_{\ell} R_{ij\ell}$$

b. Land Tract Units

For each land tract unit, certain information will be stored:

- 1) Area number (if desired)
- 2) Tract number - m
- 3) Use category
- 4) Condition category
- 5) Facilities category
 - 5a) Utilities
 - 5b) Transportation
 - 5c) Cultural

Note: Items 3 through 5 will be used as a measure of locational factor and cost of associated city improvements required with any change in land use. The combined effect will specify a locational category, ℓ , applicable to all land units in the tract. It may turn out that there are reasons for employing more than one locational category system to serve different purposes.

c. User Units

User units will be based on convenient size units, for example, for residential users--5000 people or 1,000 households; for industry, 500 employees, etc.--say normally requiring 0.01 of a census tract. The user type categories will be based on such factors as income, occupation, family size, etc.

Identification

1. User type code - i.
2. Units of users of this type - N_i .

Basic Characteristics

3. "Normal" ^{statistical} distribution of space type/condition/location use - $d_{ij\ell}$, i.e., the fraction of users of type i normally using space of type/condition/location j. within a tract?
4. "Normal" space/unit-vector by type of space unit = $\bar{s}_{ij\ell}$.
5. "Normal" rental/unit-vector by type of space unit = $\bar{r}_{ij\ell}$.

The concept of normalcy as used in describing the basic characteristics of space types and their rents is one that requires explanation. While no definition of normalcy has yet been agreed upon for purposes of the model, we view normalcy as the expectations of users in line with their income, family size and other relevant factors (in the case of residential users). For the lowest income groups, "normal" may be set by policy to insure that these groups have adequate living space.

Establishment of normal values, and the behavioral relationships that affect or are affected by them, is viewed as one of the major research tasks of the program.

Summed Data over Land- or User-Unit Type

6. "Normal" space for all user units - vector by type j of land units* = $\bar{S}_j = \sum_i s_{ij\ell} \bar{d}_{ij\ell}$.
7. "Normal" rental for all user units - vector by space type j of land units* = $\bar{R}_j = \sum_i r_{ij\ell} \bar{d}_{ij\ell}$.
8. "Normal" space for all units* of user type $i = \bar{S}_i = \sum_j \bar{s}_{ij\ell} \bar{d}_{ij\ell}$.
9. "Normal" rental for all units* of user type $i = \bar{R}_i = \sum_j \bar{r}_{ij\ell} \bar{d}_{ij\ell}$.

Using the categories and relationships defined above, it is then possible to deal with the changes in pressure resulting from the interplay between supply of space and demand for it by potential users.

Space pressure by type j is a function of the relationship between normal space demanded and actual space, or $f(S_i/S_j)$. The rental, adjusted for space type/condition j can be designated as r_{ij} , and is equal to some function of the space relationship and the base rental of space of type/condition j , or

$$r_{o,j} \left[f_i \sum_i \frac{\bar{s}_{ij}}{\bar{s}_j} \right] = \frac{1}{\bar{s}_j} \sum f_{ij} (S_{ij})$$

The rental capacity by land type/condition j is equal to:

$$f_j (R_j - \bar{R}_j)$$

As in the case of land units, locational factors can be employed, changing $\bar{d}_{ij}$ to $\bar{d}_{ij\ell}$, etc.

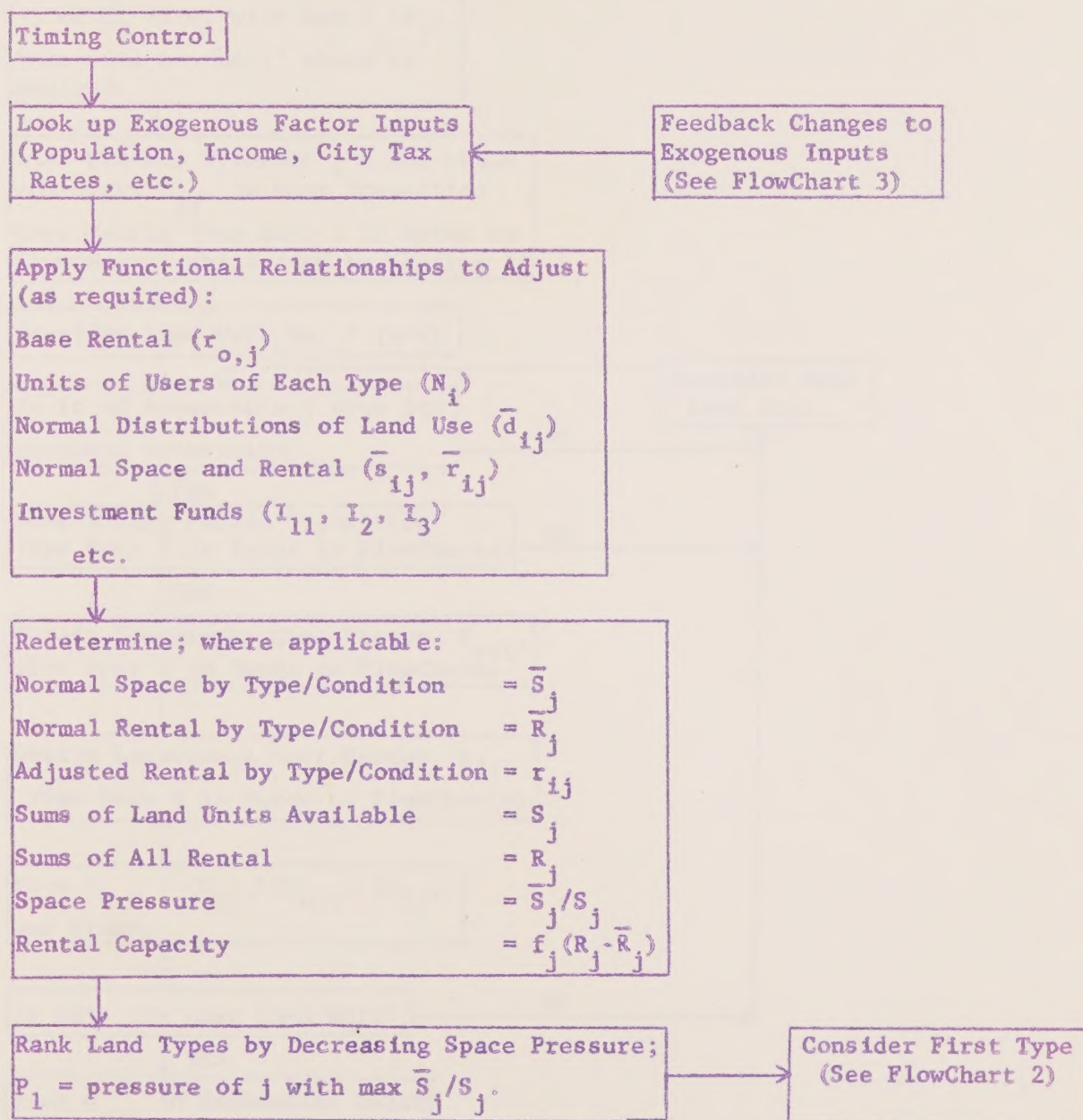
2. Operation of the Model

With the foregoing definitions, it is possible, by means of the following flow charts, to see how the model will operate. The flow charts used are merely to illustrate the operation of the model and some of the needs for data and component analyses. Since more detailed and carefully developed flow charts will be developed as work progresses, the flow charts used here may bear only a limited relationship to later charts.

* In locational category ℓ

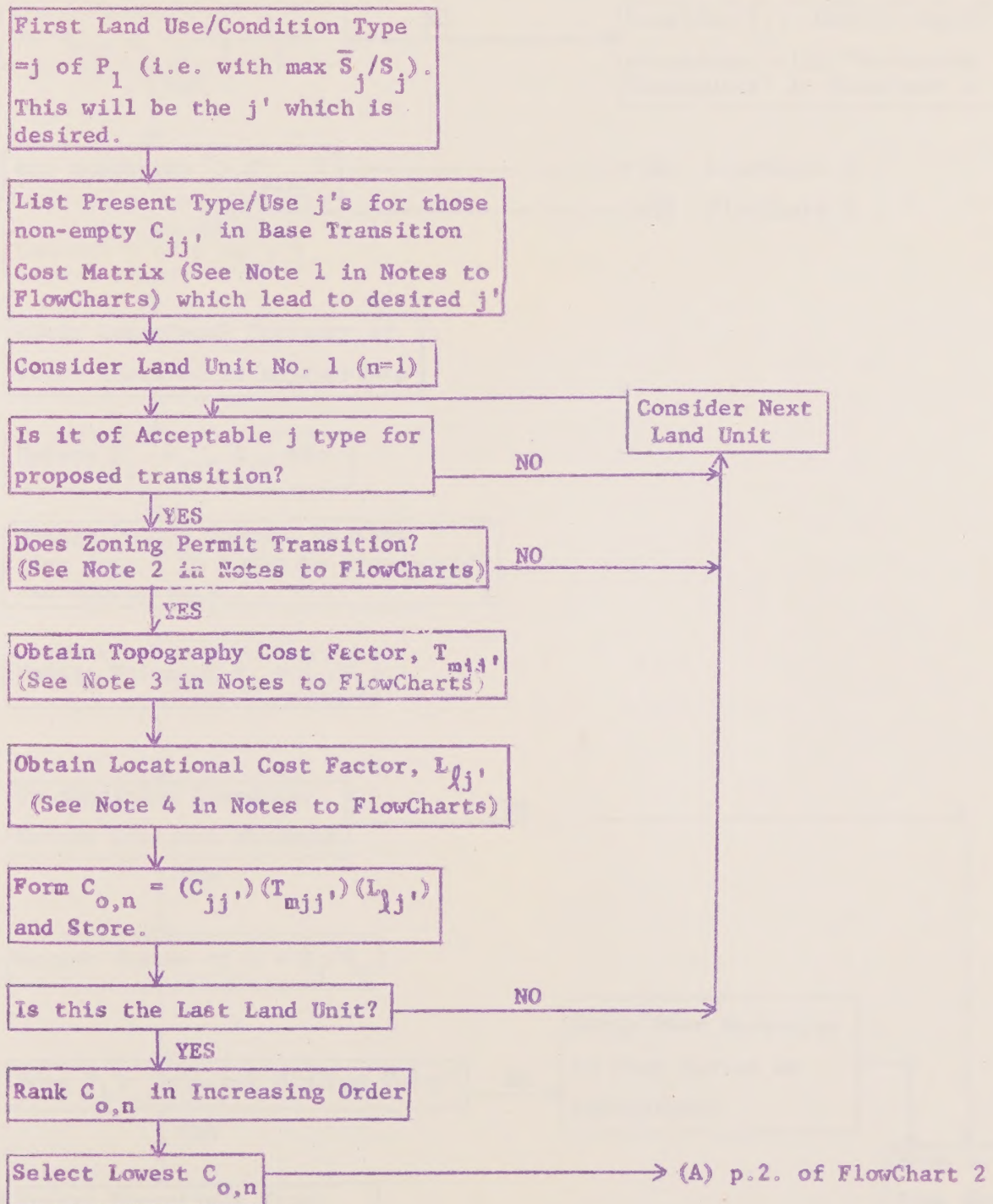
FLOWCHARTS

1. Parameter Updating and Control

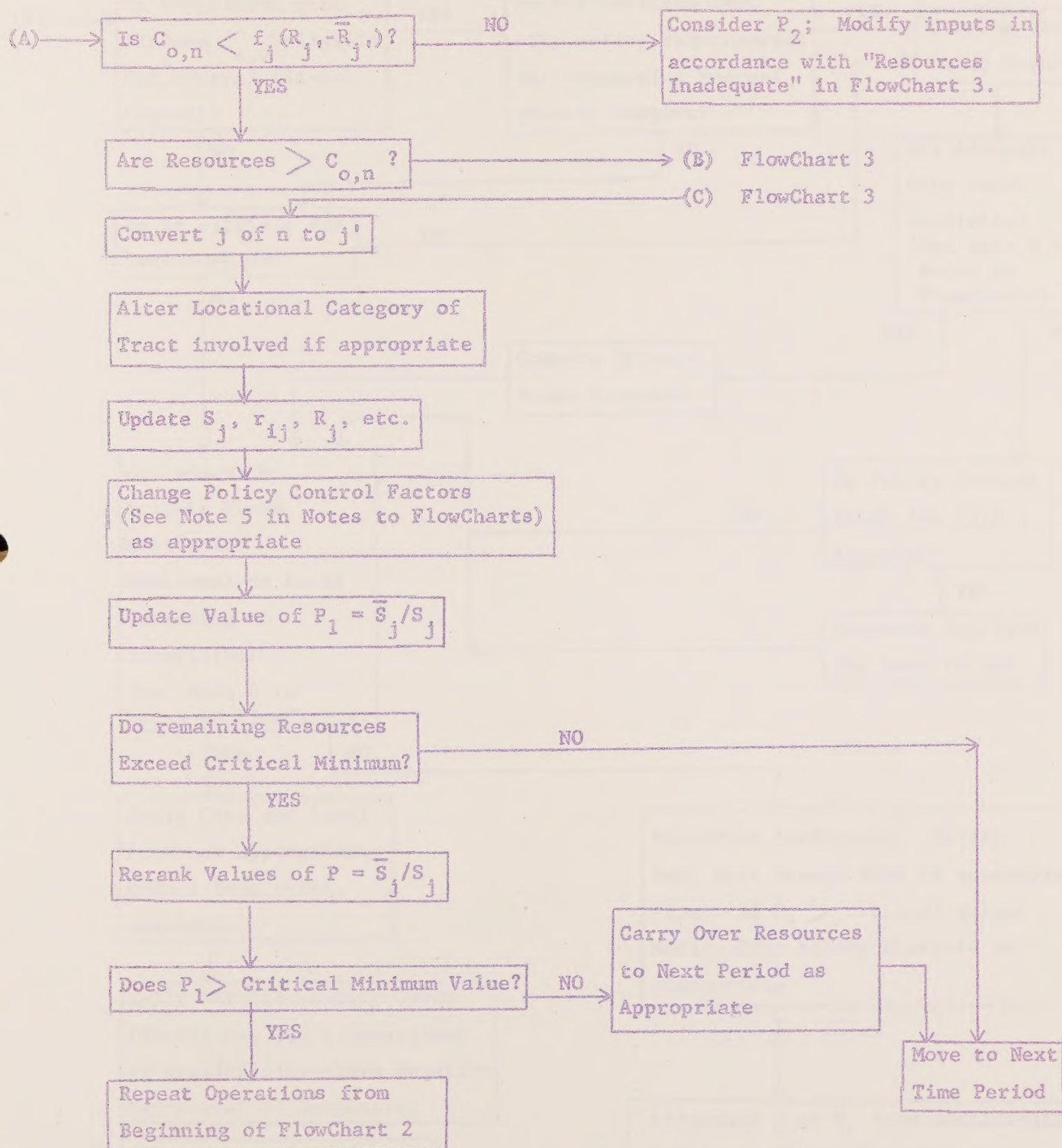


NOTE: Subscript j has been omitted from all terms in the Flow Charts.
It will be added for actual runs of the model as soon as the actual combining of j components is resolved.

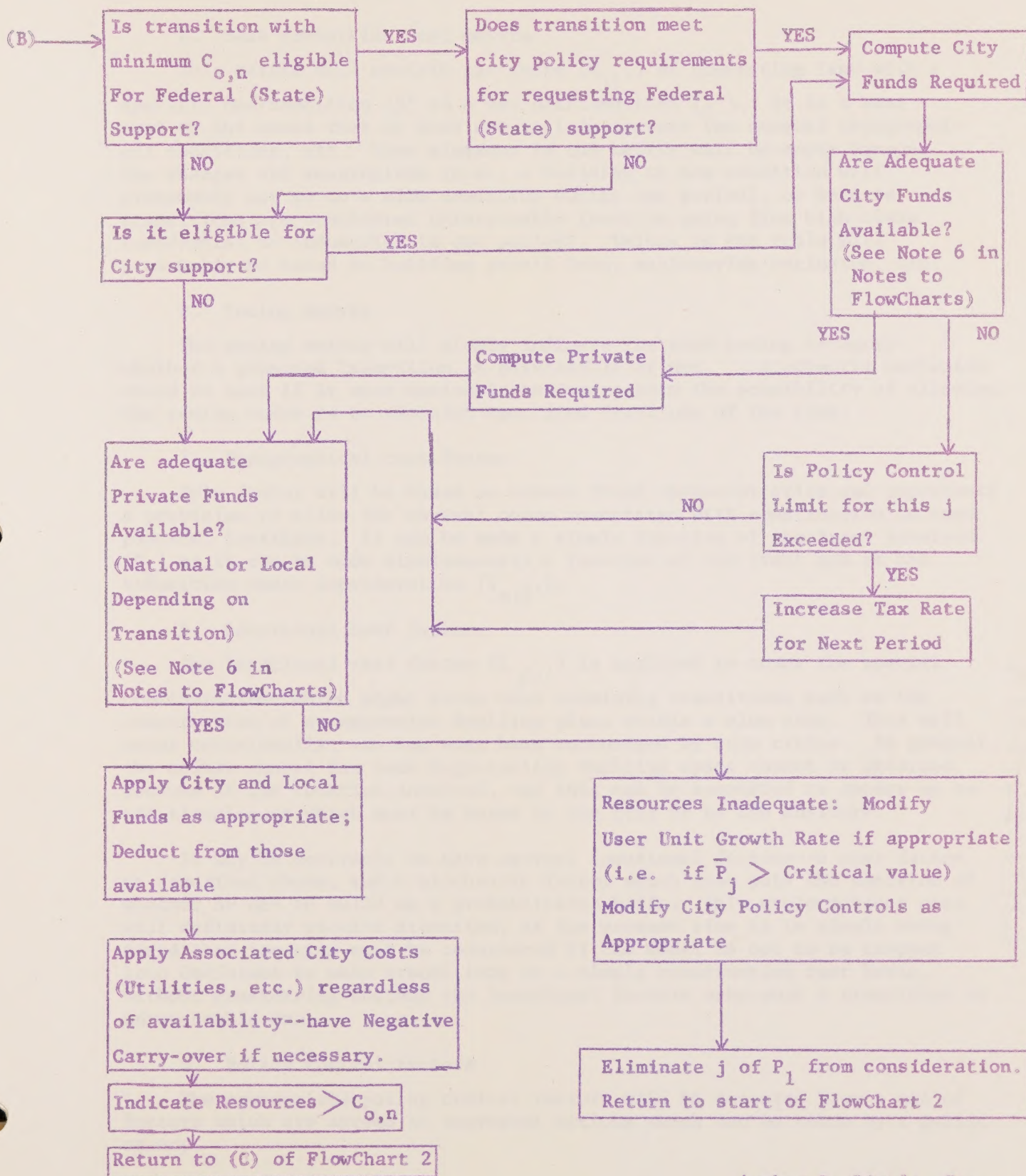
2. Transition Considerations (Page 1)



2. Transition Considerations (Page 2)



3. Resource Operations



NOTES TO FLOW CHARTS

1. Base transition cost matrix.

This matrix will contain the costs ($C_{jj'}$) of converting land with a specific use/condition (j) to a new use/condition (j'). It is a base cost in the sense that it does not include factors for unusual topographical conditions, etc. Some elements in the matrix will be empty because the changes are meaningless (i.e., a building in new condition will presumably not go to a slum condition during one period), or because transitions are considered unreasonable (such as going from high-class residential to industrial in one period). Values in the table will presumably be based on building permit data, engineering estimates, etc.

2. Zoning matrix.

The zoning matrix will simply indicate for each zoning category whether a proposed transition is permissible or not. A stochastic mechanism could be used if it were desirable to incorporate the possibility of allowing the zoning codes to be violated specified fractions of the time.

3. Topographical cost factor.

This factor will be based on Census Tract characteristics and represents a provision to allow for unusual costs associated with construction in some physical locations. It can be made a simple function of the tract involved (T_m) or it can be made simultaneously a function of the tract and of the transition under consideration ($T_{mjj'}$).

4. Locational cost factor.

The locational cost factor ($L_{jj'}$) is employed to cover the special considerations which might arise when examining transitions such as the construction of an expensive dwelling place within a slum area. This will occur occasionally, and has even been encouraged by some cities. In general, the normal rental for such high-quality dwelling space cannot be obtained because of the location involved, and this can be converted to appear as an additional cost which must be borne by the city or by the builders.

It may be desirable to have several locational factors--a cost factor as described above, and a stochastic factor which then puts the decision of whether or not to build on a probabilistic basis. This whole subject area will definitely require attention; at the present time it is simply recognized that location must be considered if the model is not to be trapped into decisions to make transitions on a simple construction cost basis, without considering whether the locational factors make such a transition an unreasonable one.

5. Policy control factors.

The appropriate policy control factors will be selected from a set of factors which are agreed to represent actions which can be taken by a public agency.

This is not a true definition of locational factor, but an environmental or relative unitary factor.

6. Financial resources.

The various types of financial resources, their availability, potential use codes and potential linkages are summarized in Table I.

TABLE I

FINANCIAL RESOURCES

<u>Code</u>	<u>Type</u>	<u>Availability Set By</u>	<u>Potential Use Code</u>	<u>Leverage</u>	<u>Potential Linkages</u>	<u>Holdover</u>
I ₁₁	Private-Local	Population-Income Trend	A,B,all C,all D	1.0	None	f ₁
I ₁₂	Private-National	Unlimited	A, C-1, C-5	1.0	None	Not applic.
I ₂	City	Area P-I Trend	C-5,D-5,E,F,G,H	L ₂	None	0
I ₃	State	State P-I Trend	F, H	L ₃₂ ,L ₃₁	I ₂ plus I ₁₁ or I ₁₂	0
I ₄	Federal	Unlimited - (Policy Input)	C-5, F	L ₄₂ ,L ₄₁	I ₂ plus I ₁₁ or I ₁₂	No applic.

- NOTES: (1) Leverage indicates that dollars provided by linked sources will be increased by the leverage factor through dollars provided by the specific source.
- (2) Holdover: A fraction of local investment funds will remain available (i.e., will not be expended out of the area or for other purposes) if not used during a specific time period.
- (3) ABBREVIATED USE CODE (General - to be further broken down or divided as desirable).

A	Non-Residential* Construction	D	Residence Improvement
B	Non-Residential* Improvement		Subcodes as above
C	Residence Construction		
C-1	Large High-Rise Apartment	E	Utilities
C-2	Small Apartment	F	Transportation
C-3	Duplex Housing-Row Housing	G	Recreation
C-4	Private Homes	H	Education
C-5	Special Low-Cost Apartments		

*To be broken into more detailed categories.

3. Output of the Model

For each time period covered by the model, the expected output will include the following:

1. A statement, by census tract and for the City as a whole, of the uses to which all land is being put.
2. A statement, for the City as a whole, of the desires of various population categories for each type of land use.
3. A statement on the amount of investment made during the period and the uses to which it has been put.
4. The implications of specific public policies, e.g., zoning, code enforcement, tax policies.
5. Related effects of the assumptions about exogenous inputs.

Technical Memorandum #3

RESEARCH PROGRAM

Technical Memorandum #2 describes the preliminary model that has been developed as the basis for preparing San Francisco's Community Renewal Program. We are satisfied that even in its present preliminary form the model is conceptually and structurally sound. The task immediately ahead is to make it "operational."

While we are hopeful at this point--indeed, more hopeful than when the project first started--that a workable and usable model can be successfully developed, there are still some difficulties to be surmounted. As reflected in Technical Memorandum #2, the data requirements of the model are very large, complex and, perhaps, extremely costly. The classifications of the various components must be extremely fine. We must seek measurable data which can be manipulated in the mathematical logic of modern analytic techniques. Space must be classified and divided into suitable units. The attributes of users must be scaled. The behavior of users and investors must be stated in precise terms. At the same time, units of measurement must be chosen which will be of sufficient detail, yet will not pose unreasonable computational burdens.

Whether these data needs can be met within the budget will not be known until work has progressed further, on Phases II and III of the program. January, 1964, has tentatively been set as the critical decision month, that is, the month during which decision will be made to proceed with the model as presently conceived, to proceed with a simpler, modified form of the model, or to abandon the use of this type of model altogether. (We hope that we can reach a decision even before January.)

We believe that even a modified version of the present model will prove useful in achieving the ultimate objectives of the Community Renewal Program. In the event that a decision is reached to abandon the model altogether because funds are inadequate (and supplementary funds are not available) or because of data limitations, other methods of analysis and forecast will be used to prepare the Community Renewal Program, making full utilization of the information collected during the intervening period. In such an event the model will at least have served the purpose, referred to in Technical Memorandum #2, of organizing our thinking and research along consistent and useful lines.

In view of the foregoing considerations, the research program outlined in this memorandum has been designed to serve a dual purpose. On the one hand, the program will serve to supply the information for the various determinations required to establish the model's operability. On the other hand, the program will meet the requirements of later phases in the event that decision is reached to abandon the model.

The research program is discussed in two parts. Section A lists the main behavioral relationships that must be established and the key determinations that must be made to make the model operable. Section B lists the basic studies, field surveys and data collection tasks which will provide the information for use by those personnel responsible for the actual design and construction of the model. Until a decision is reached on whether to proceed with the model, surveys and data collection, as listed under Section B, will be on a selective basis and at a level sufficient to permit the establishment of the required key relationships. When decision is reached to proceed with the model (or when an alternative program is selected), information gathering will be on a more widespread basis.

Two other factors must be evaluated carefully during the period prior to January, 1964. First, detailed estimates must be made of the cost of programming the model for the computer. If the costs are excessive, the model must be modified or abandoned. Second, detailed estimates of the total work requirements of city personnel beyond January, 1964, during the more intensive data collection period, will be required to be certain that the city agencies have adequate personnel of the appropriate skill levels to supply the assistance which is an integral part of the total program for three reasons:

1. The collection, tabulation and processing of data will be of such a magnitude that only with the appropriate level of assistance from city agencies can the program ~~be~~ presently conceived be carried on;
2. The direct participation of city personnel in the program formulation will help to insure acceptance of the program by the various City departments and agencies when it is completed;
3. The familiarity of City agency personnel at a detailed level is essential if the Community Renewal Program is to be an on-going operation.

A. IDENTIFICATION OF KEY RELATIONSHIPS AND DEVELOPMENT OF APPROPRIATE METHODS FOR OPERATION OF THE MODEL

Since the model was conceived in its preliminary form, we have been examining its operational implications. As a result, we have identified a number of data requirements and key relationships that must be investigated during the next stage of the work. In many cases, these research program items go beyond the detail of the model as presented in Technical Memorandum #2, but any change in the model's description or operation will depend on the outcome of the investigations described below.

As presented in the following sections, the first set of tasks (1 a through 1 f) relate to the basic units, components and categories of the model. The remaining tasks, which cover the key relationships, that must be established if the model is to become operable, are presented in the order in which they will come into operation during a single iteration of the model as presently conceived.

1. Establishment of the Relevant Units, Components and Categories for Operation of the Model.

This task is basic to all elements of the model. It encompasses several sub-tasks, which are related and are designed to establish the components and categories upon which the model is to operate and the units by which these components and certain other operating features will be measured. These tasks must be undertaken during the early months of the coming budget period, for the scope and nature of many of the subsequent research tasks will depend on these prior determinations.

a. Establish Length of Time Interval

Time interval, as used here, refers to the length of each iterative period over which the model will operate. We have already agreed that this period should be short enough so that any given space unit is not likely to make two transitions within the time period but long enough so that one complete transition (from the start to completion of actual on-site construction) can be completed within the period. At the same time, consideration must be given to the possibility of including an interval during which the use of certain space units would be "frozen." Such a time interval could be used, for example, when, as in the case of a redevelopment project, land has been acquired, but no new use can occur until other parcels have been acquired.

Information for this research task will be obtained from interviews with City officials and construction "specialists" as well as from available data, as revealed in the Data Reconnaissance Program.

b. Determination of the Appropriate Size of Land Units

In Technical Memorandum #2 two types of land units were mentioned as being included in the model. One, referred to as the basic land unit, will serve essentially as the unit for data collection on a summary basis, in particular for location purposes. This will be a fairly large land unit and will probably be based on the Census Tract or the Enumeration District, since time series data appear to be the most available for these two categories. A decision must be made on the appropriate unit at an early stage during the coming period.

The other type of land unit, and the one that will actually be manipulated in the model, will be a small percentage of the basic land unit; it is referred to as a "space unit." These "space units" may consist of city blocks or be the equivalent of city blocks. Two important questions must be answered in this connection:

1. Will the space-unit represent land area or building floor area? In the main, this will depend upon the form in which we desire the model's output.
2. What size of space unit will be used, irrespective of whether it is in terms of land area or floor space? We have decided that all space units will be of the same specified measurable area (whether expressed in square feet or acres). Thus, if land area is used, the total number of space units of the inventory remain fixed; if floor space is used, the total is variable.

An appropriate criterion for making this determination is our agreement that a space unit should be small enough to belong uniformly to a single space type at any time and to undergo a transition as a unit (that is, parts of it will not be likely to undergo separate transitions at different times); and large enough that it is not likely to be consistently a part of the larger units which possess the above characteristics. (This is a machine time-saving requirement.) *machine organization*

Our proposed study on changes in space types in the past, with special emphasis on the sizes (in floor space and/or land area) of space units which have undergone single transition in the past, will be of value here in helping to make this determination.

c. Determination of the Appropriate Size of User Units

It is clear that the size of residential user-units will be different than the size of non-residential user-units. However, all residential user-units will be of the same size and all non-residential user-units will be of the same size. It is probable that a set number

of persons, or households, in the case of residential user-units, and a set number of establishments, or some other unit, in the case of non-residential user-units, will be chosen. One user-unit will not, however, occupy one space-unit. The number of user-units per space unit will vary, depending on the user-type involved. (See Section A 1 f)

The primary criterion for making this determination, it would appear, is machine time and storage capacity. The size of the user-unit should be small enough so that each unit can be expected to perform transitions as a unit (that is, parts of each unit should not be likely to perform separate transitions at different times on different types of space).

d. Identification of the Types of Transitions

Transition, as used here, refers to the "change" in the use of space during each iterative period over which the model is to operate. We must identify the kinds of transitions with which the model will be concerned. It would seem that we will be concerned with the following categories of transitions:

1. New construction on existing vacant land;
2. Rehabilitation, including conversion, of existing space;
3. Demolition of existing stock and construction of new structures on the same site;
4. Demolitions of the existing stock with no replacement;
5. Maintenance-improvements to existing stock;
6. House movements.

Many types of transitions can be made only by clearing the old structures on the space-unit and constructing new ones; e.g., a transition from a factory block to a block of single-family homes. In the case of a transition from a large single family home to a four-unit multiple dwelling, however, the transition might be made either by demolition and new construction or by rehabilitation.

Another distinction that must be made in the model is between positive ("up") transitions and negative ("down") transitions. The former come about as a result of new construction, conversions and improvements in the quality of the stock, and result in additions to the stock of space of a particular type, as well as increases in the quality of the stock. Negative transitions result from demolitions and deterioration in the quality of stock of space of a given type.

e. Determination and Classification of Space-Types ("j" groups)

The determination and classification of space-types is a task of high priority, for many of the subsequent research tasks will depend upon the outcome. Development of an appropriate classification depends upon several sub-tasks:

1. The establishment of a list of relevant differentiating variables or elements. These variables will cover those characteristics or qualities of space which are significant to the users and other "actors", and form the basis of such decisions as "to occupy," "not to occupy," "to perform a transition," "not to perform a transition," etc. *spatial attributes*

A preliminary list of the relevant variables which will be studied includes:

- (a) Land use
- (b) Building type
- (c) Size, e.g., number of rooms per unit
- (d) Condition
- (e) Rent and imputed rent
- (f) Tenure
- (g) Location ("neighborhood") category

- one* →
- (1) Surrounding land uses
 - (2) Neighborhood structural conditions
 - (3) Neighborhood social conditions
 - (4) Availability of public facilities
 - (5) Accessibility
 - (6) Neighborhood amenity values

must be established on the basis of a combination of the needs of users (types) and the relative availability of space through market conditions for available resources

2. The establishment, within the possible range of each variable, of the number of possible categories which are needed.

3. The establishment of definite limits to the classes within the range of variables.

4. Selection of the appropriate combination of ~~variables~~ *categories or attributes* (for example, should type, condition, size, topography, accessibility, amenities, be separated, or combined into various categories?)

The main criterion for the selection of the variables is relevance, as stated above. However, the numbers and limits of categories will be determined in part by machine time and the storage capacity of the computer

and in part by the availability of data. However, within these limits, the other criteria for selection should be derived from an analysis of the operations of the space market. Basically, each space type, as finally selected, should be such that the user and other actors regard it as essentially homogeneous from the standpoint of their potential actions on it.

Thus it should be defined in respect to the specific space needs of the user as reflected in market decisions

It is already clear that we will have a "combinatorial" problem in this regard; that is, we will have to carry out regression analysis, or perhaps factor analysis, in which every variable is compared with every other variable in the framework of actual user-actions (e.g., decisions to occupy, undergo transitions, etc.) that have occurred in the past. If two variables are shown to have affected action in essentially the same way, one may be eliminated. If two potential classes within the range of any variable are shown to have affected actions in essentially the same way, they can be combined into one category.

The data required to determine and classify the various space-types will be drawn from the study on stocks of space (See B, 1, below), as modified by the advice of our operations research specialists.

f. Classification of User-Types ("I" groups)

Along with the identification of the space-types, one of our first research tasks will be to classify the user-types. This will involve several sub-tasks, quite similar to those required in the case of the space-types study.

1. It will be necessary to establish a list of relevant differentiating variables, those characteristics of users which have a significant effect on their desires and actions relative to space. A preliminary list of such variables, to be investigated during the coming months, includes:

Space-types must be identified on the basis of homogeneity with respect to space needs expressed in terms of spatial attributes

(a) Residential user-types

- (1) Family size
- (2) Family composition
- (3) Family income level
- (4) Rent/income ratios
- (5) Race
- (6) Age of family head - ages of family members
- (7) Education of family head - education of family members
- (8) Occupation of family head - occupation of family members

(b) Non-residential user-types

- (1) Activity (by SIC code, or some other system corresponding with land-use classes)
- (2) Size of establishment

(b) Non-residential user-types (cont.)

- (3) Economic indicators of volume of activity, e.g., value added, total sales, etc.
 - (4) Goods access requirements, e.g., need for access to ship, rail, plane, highway, etc.
 - (5) Customer access requirements, e.g., need for access to transit, highways, etc.
 - (6) Fixed equipment requirements
 - (7) Rent paid or ratio of rent to sales
 - (8) Local or non-local market + basic orientation
2. We must establish within the range of each variable, the number of possible categories which are needed and/or possible.
 3. Associated with the above, there is the need to establish definite limits to the classes within the range of each variable.
 4. There is the need to select the appropriate combination of these variables.

Generally, the criteria for selection are the same as for space-types, that is, relevance, data availability, and machine storage capacity. Ideally, user-types should be homogeneous in the sense that all members of the type are expected to respond in a like fashion to a change in space-types; and they can be expected to attempt to take the same actions relative to space given any particular state of the stock.

As in the case of the space-types, it is clear that we shall have a combinatorial problem here. We shall therefore carry out regression analysis, or factor analysis as part of this study.

The data required to determine and classify the various user-types will be drawn from the study on users (See B, 2, below), as modified by the advice of our operations research specialists.

2. Development of a Method for Forecasting the Number of User Units by Type (N_i)

The model requires that at the beginning of each time-period the number and type of user-units be forecast and inserted as one of the exogenous inputs. A method must be developed for forecasting the numbers of user-units (made up of households, establishments, etc.) of each type (i group) that will be located in the city or will be seeking to locate in the city during each time period. We anticipate that the forecast will involve an economic base study of the Bay Area including, among other items, forecasts of (1) the future level of economic activity (number of employees and establishments in each industry group) in the Bay Area; (2) the future number of households in the Bay Area derived from the above, as modified by demographic variables; (3) the distribution of the total number of establishments and households by type (i group) in the Bay Area.

1. The first group of results shows that the majority of the respondents are in the age group of 25 to 35 years.
2. The second group of results shows that the majority of the respondents are male.
3. The third group of results shows that the majority of the respondents are employed.
4. The fourth group of results shows that the majority of the respondents are from the urban areas.
5. The fifth group of results shows that the majority of the respondents are from the middle class.

We must not forget that the above results are only indicative and should not be taken as a final conclusion.

It is also worth noting that the above results are only indicative and should not be taken as a final conclusion.

There is no need to repeat the above results as they are self-explanatory.

From the above results, it can be seen that the majority of the respondents are in the age group of 25 to 35 years, are male, are employed, are from the urban areas, and are from the middle class. This indicates that the survey was conducted among a specific group of people.

It is also worth noting that the above results are only indicative and should not be taken as a final conclusion.

The above results are only indicative and should not be taken as a final conclusion.

2. The following are the results of the survey:

The first group of results shows that the majority of the respondents are in the age group of 25 to 35 years. This indicates that the survey was conducted among a specific group of people. The second group of results shows that the majority of the respondents are male. This indicates that the survey was conducted among a specific group of people. The third group of results shows that the majority of the respondents are employed. This indicates that the survey was conducted among a specific group of people. The fourth group of results shows that the majority of the respondents are from the urban areas. This indicates that the survey was conducted among a specific group of people. The fifth group of results shows that the majority of the respondents are from the middle class. This indicates that the survey was conducted among a specific group of people.

A method must be developed also to allocate to the city at the start of each iterative period the appropriate share of the total Bay Area user-units and to reflect the model's results for the preceding time period.

3. Clarification of "Space Pressure" Concept and Development of Methods for Forecasting its Components

As discussed in Technical Memorandum #2, the concept of space pressure is critical to the underlying approach and operation of the preliminary Community Renewal Programming model. As presently conceived, this concept expresses a relationship between the normal space or a particular type demanded by all users and the amount of space of that type actually available. An imbalance between the demand for and the stock available of a particular type of space is then expressed as a pressure for that type of space. In this sense, the concept is somewhat akin to a ratio of the future demand for space of various types to the existing supply of space of those types. However, rather than demand in the traditional economic sense, the model actually deals with a quantity that might be more aptly termed "user-expected-space"--the amount and type of space that different categories of users desire and actually expect, considering their income, family size and other characteristics. As such, space pressure may be defined as the total amount of user-expected-space of a given type for which demand is likely to arise during a given period, relative to the amount of that type of space available in the city to satisfy these expectations at the beginning of the period.

One of our first research tasks will involve an analysis of this relationship, in particular the concept of "normalcy", and the development of techniques for making the concept operational. As presently conceived, the following research tasks have been identified:

a. Development of a Method to Inventory the Existing Space by Space-Type, as of a Base Year Date (S_j)

This will be essentially a tabulation of the number of space-units in the city devoted to each space-type (j), as defined earlier, as of the base year date in which the model operation is to begin. Once the operation of the model begins, one of its outputs at the end of each period will be a similar inventory to serve for the start of the next period.

b. Development of a Method to Forecast the Distribution of User-Expected-Space types within each User-type ($\bar{d}_{ijl}$)

It will be necessary to develop a method to estimate the percentage of the user-units in each user-type which will desire and expect to receive each space-type, as of the next time-period.

A second and third series of experiments were conducted in the same manner as the first series, the only difference being that the subjects were not informed of the purpose of the experiment.

Experiment 2: The Effect of Practice on the Accuracy of the Response

The purpose of this experiment was to determine the effect of practice on the accuracy of the response. The subjects were divided into two groups, one of which received practice trials before the main series of responses, and the other of which did not. The results showed that the group which received practice trials was more accurate than the group which did not. This was true for both the first and second series of responses. The results also showed that the accuracy of the response improved with practice. This was true for both the first and second series of responses. The results of this experiment are consistent with the results of the first experiment, which showed that the accuracy of the response improved with practice.

One of the main reasons for the improvement in accuracy with practice is the development of a motor habit. As the subject practices the response, the motor habit becomes more automatic, and the accuracy of the response improves. This is true for both the first and second series of responses.

Experiment 3: The Effect of the Number of Practice Trials on the Accuracy of the Response

The purpose of this experiment was to determine the effect of the number of practice trials on the accuracy of the response. The subjects were divided into three groups, one of which received one practice trial, one of which received two practice trials, and one of which received three practice trials. The results showed that the group which received three practice trials was more accurate than the group which received two practice trials, which was more accurate than the group which received one practice trial. This was true for both the first and second series of responses.

Experiment 4: The Effect of the Number of Practice Trials on the Rate of the Response

The purpose of this experiment was to determine the effect of the number of practice trials on the rate of the response. The subjects were divided into three groups, one of which received one practice trial, one of which received two practice trials, and one of which received three practice trials. The results showed that the group which received three practice trials was faster than the group which received two practice trials, which was faster than the group which received one practice trial. This was true for both the first and second series of responses.

c. Development of a Method to Forecast the Amount of User-Expected-Space per unit of each User Type, as allocated to each Space-Type ($\bar{s}_{ijl}$)

This task relates to (b) above, and is designed to indicate how much of a particular space type (in acres or square feet) each of the user-units expects.

It is expected that the data required for these research tasks will emerge from the Space and Users studies described in Section B.

4. Development of a Screening Process for Forecasting Market-Initiated Changes in the Space-Use System

In the operation of the model as presently conceived, once the pressures for different types of space have been determined and ranked, the model then seeks to determine the actual physical changes (i.e., transitions) in the city's stock of space that are likely to result. In other words, given a pressure for a certain j type of space, the model will examine each space-unit in the city relative to a set of pre-established conditions, criteria and rules to determine whether that space unit is likely to be changed by the market to make it a given j' type. This procedure, in effect, constitutes a "screening" process, a term used in this memorandum to correspond, in the main, with the terms "transition considerations," and "resource operations," as used in the description of the model in Technical Memorandum #2. The screening process, in short, involves a determination of the extent to which the city's private financial resources, public policies, social considerations, and other limiting conditions, constraints, and inducements would permit the desired transitions to take place.

This step in the model's operation deals only with changes which might be initiated directly by the private land and real estate market: new construction, rehabilitation, conversion, maintenance-improvements, and demolitions relative to privately-owned space. The conditions, criteria and rules that will be developed will be those which apply to private builders, developers, and investors. This means that direct public-instituted changes in stock are not considered at this point in the model. (See 6 below.) This does not mean, however, that public actions are not considered here; they are, in those instances where they may influence the conditions, criteria and rules which determine whether or not private-instituted transitions will be made. Thus, public policies enter at such points where they may affect: (a) those transitions that may not be permissible according to present zoning regulations, or may be barred by certain non-economic factors, such as racial discrimination; (b) the costs of transitions; (c) the rental capacity of certain groups in the population; and (d) the sources and amount of private investment funds available. but this determines the space pressure

Sections 5 and 6, which follow, deal with those direct changes in the stock of space which will be instituted by means other than market action; namely, by natural forces, and by public agencies.

With respect to market-initiated changes, we have already agreed upon certain minimum screening criteria that will be incorporated in the model. In the period ahead, we will seek to refine the model further, and to add to these criteria, where necessary and appropriate. Some of the operational steps must still be detailed, while others will probably be added. The task, in general, will be to develop methods for quantifying the conditions, criteria, and rules, incorporating them in the model, and translating them into computer logic. The major research tasks which are planned in this regard are the following:

a. Development of a Method to Eliminate Improbable Transitions

It is unlikely that all of the possible types of transitions that could be represented by a full matrix would realistically occur. For example, it is improbable, at least during one iterative period, that a space unit occupied by a multi-story office building would make the transition to a single family residential home. In order to save machine scanning time, we plan to eliminate the improbable transitions from consideration in the screening process. An immediate task, therefore, will be to determine those transitions which are considered to be improbable and to develop a method for incorporating in the model a means of eliminating these transitions.

b. Development of a Method to Establish a Range of Alternative Zoning Regulations.

As the model is presently conceived, the effect of zoning is introduced into the model by making it impossible for certain transitions of space units to occur. A zoning matrix will have to be developed to indicate, for each zone category, whether a proposed transition is permissible or not. It has also been suggested that some probabilistic mechanism be developed as well to include the possibility for variances and illegal transitions, at a specified rate over a period of time. To achieve this, it will be necessary to design, in conjunction with city personnel, a range of alternative zoning policies, limited to a set which can be established as "relatively feasible" by intuitive or conventional planning techniques, and to reach agreement on a reasonable frequency for such violations.

c. Development of a Method to Establish Alternative Code Enforcement Programs.

Code enforcement is another type of public action which does now, and can in the future, have significant effects on space transitions within the city. (In this context, code enforcement is defined as the process of inspection, listing of violations, and legally forced subsequent repairs

relevant to an existing structure during one period of the model's operation; i.e., a program of public action similar to code enforcement programs currently under way in renewal "conservation" areas.) Its objective is to improve the condition of structures and not necessarily to change land use. However, its objective is not always realized. Since our model attempts to simulate real market decisions, we must explain and deal with code enforcement as it realistically affects the decisions of developers, owners, etc., to make transitions. Code enforcement in fact may produce any of a series of alternative transition types.

From the perspective of the development decision we find that code enforcement is quite unlike most other types of public actions. It is not like actual public-instituted transitions (e.g., the construction of public buildings, etc., to be discussed later); private parties still make the actual transition, the public does not. It is also unlike zoning, which simply eliminates the possibility of transition to certain space types. Zoning does not force any action on the part of developers. Code enforcement, however, does force action. It affects the owner's and/or developer's decision by, in effect, eliminating the "no action" alternative. It is, therefore, a "pressure" for change, but one which is quite unlike the concept of market-generated pressure discussed above. The latter is related to a specific space type; it is a general force which applies everywhere, but affects actual transition decisions on only those few parcels which are suitable for the specified space type. Code enforcement pressure, on the other hand, is not related to a specific space-type; it may force the owner to vacate the property, improve it, or tear it down and build any of a number of possible new space types. It does not apply generally, but rather only to a few specified space units; and in the case of these units it definitely affects all transition decisions.

The specific operational procedure by which code enforcement will work in the model has not as yet been established. One way it could possibly work is by inclusion as part of the screening process. Suppose, for example, that a high degree of pressure exists for four-unit apartments. As the model scans through the space-units, after it responds to the "improbable transition" and "zoning" screens, it could also pass through a screen which asks "is this space-unit under code enforcement?" If it is not, the model would go on to test whether the transition of the particular space unit to a four unit apartment would be a profitable, and a possible one, in light of available investment funds. If it is, the transition would be made; if it is not, the space-unit, at least temporarily, would continue in its present use and condition. If the unit were under code enforcement, however, it would be legally impossible to retain it in its present use and condition. The owner or developer would have to make a change.

He would thus view the possible transition to the space-type under question from an entirely different point of view. Without code enforcement the property might have been a more profitable investment in its present use

and condition; with code enforcement the developer might find that the transition is actually the "least-cost" alternative open to him. Thus, simply by eliminating the "no-change" alternative in the model as we come upon a unit under code enforcement, we completely alter the cost structure surrounding a transition-decision and thus exert a strong pressure for change. At the end of the screening process, there will remain some space units under code enforcement which have not made transitions. A last screen may then be run to examine the costs of alternatives still open and make transition to such types as "vacant," "demolition," etc.

The research task associated with this phase encompasses the job of studying past code enforcement efforts to see what results they have actually produced. How do they operate in cost terms within the framework of the developer's decision? What effect does the timing of the process have on the results produced? In terms of the city's resources, how expansive a code enforcement program is actually feasible? Asking questions such as these in relation to historical data on past programs should lead the way to the development of a realistic range of alternatives in the future. These alternatives will be sufficiently detailed to include the nature of the code violation, the location of the violation, and the timing of the enforcement process relative to each.

d. Development of a Method for Forecasting the Nature and Extent of Non-Economic Barriers to Transitions

Allowance must be made in the model for the fact that certain non-economic barriers, such as racial discrimination, exist and prevent transitions from occurring for the benefit of certain user groups. Such social factors may affect transitions in two ways: (1) from the point of view of the desires of the buyer-locator (taken care of in the establishment of the vector d_{ij} , (See Section A,3)) and (2) from the point of view of the desires of sellers or neighbors, for which allowance has not yet been made. A method of forecasting the extent to which such barriers will act on the system is desirable and must be developed.

e. Development of a Method for Forecasting the Costs of Transitions

An important element of the model is the relationship between the cost of carrying out a given transition and the capacity of the users to pay a rental sufficient to make it feasible for developers to undertake the transitions. Three sets of determinations will be required to arrive at a method of developing appropriate estimates. The first, which is discussed here, involves the development of a method of forecasting the total cost of each type of space transition. The other two tasks are discussed in the succeeding two sections. The cost forecast must be subdivided into its various components if it is to be meaningful and to provide a sound, comprehensive matrix for each conceivable transition type.

The following costs will be taken into consideration: (a) The cost of land, (b) the cost of demolition of existing structures (if applicable), (c) the site preparation cost, including any special topographical features, (d) special cost adjustments to allow for the effect of any associated city improvements that might be required, (e) base construction costs (the actual cost per square foot of construction for each j type) and (f) financing costs.

At this point, it is important to differentiate among the different types of transitions (See A, 1, d, above), e.g., new construction, rehabilitation, maintenance-improvements, etc. The costs of these transitions vary, both as to the components and in total. It will probably be necessary to develop separate cost matrices for different transition types.

Public actions may affect the above costs in many ways, through taxes and assessments, renewal land policies, differential financing costs, etc. Therefore, it will be necessary to establish a range of possible public policies and to specify how these will affect the forecasts of the above cost factors, based on a study of how such policies have affected costs of different types of transitions in the past.

f. Explicit Definition of the Rent Capacity Concept and the Development of a Method for Forecasting Rent Capacity

A very important concept underlying the model is that of rent capacity. At this stage of the program, this concept is inadequately defined for our purposes. For this reason, one of the major tasks in the coming months will be to arrive at a more explicit definition and use of rent capacity. At this time, we view rent capacity as a representation of the amount of money that will be available to users to meet the cost of various transitions. Rent and rent-paying ability will have to be related to the various user groups and, in turn, to specific space transitions. Accordingly, we must develop a method to forecast the future rent capacity of different user groups.

This will necessitate estimates of future consumer (and business) income and then forecasts of rent (or imputed rent) income ratios. This, in turn, will require knowledge of consumer (and business) behavior, e.g., the share of the overall family budget which will be allocated to housing (and the total operating cost structure of firms and that share which is allocated to space).

It is anticipated that the economic base study referred to in Section B,2, below, will be designed in such a way that it will provide the needed data on consumer expenditure patterns as well as commercial and industrial patterns, and on rent-income ratios, to permit us to make the necessary forecasts.

As in the case of costs of transition, public actions can be used to significantly alter normal market-determined rents in certain instances. Such potentially usable tools as rent control and rent subsidies (in any of a number of forms) can greatly alter the rent capacity available for any given transition period. We will seek to establish a range of possible alternatives along these lines and, if necessary, to devise new policies that might supplement available policy tools. We anticipate that our study of public policies, programs and actions should throw some light on this.

g. Development of a Method to Relate Costs and Estimated Rent Capacity

Once information is available on the cost of various types of transitions and the rent-paying capacity of various types of users, it will be necessary to relate the two cost and income structures in such a way that "go" or "no-go" decisions can be reached for each type of transition. Our focus will have to be on cost-profit calculations of the owner, developer or other individuals or groups that will actually initiate the transitions. We will need to know the relationship between the total cost and the expected rents that motivate them to proceed with a transition. This research task, therefore, involves the development of decision rules of owners-developers-builders and the conversion of such rules into computer logic. We will draw upon the data that emerges from our study of builders and private investors (Section B, 3, below) for the development of such decision rules.

h. Development of a Method for Forecasting the Amount of Private Investment Funds Available and Criteria for their Allocation to Different Types of Space Transitions

The three previous research tasks as described deal with factors that the "transition-initiator" must deal with to decide whether or not to undertake a given type of transition. The final decision to proceed is always conditioned by the availability of funds to finance the transitions. As the model is presently conceived, once it determines that a transition can occur, it must determine whether investment funds will be available for this type of transition.

Our economic base study (Section B, 2) should yield information which will provide a basis for determining the total volume of private funds available for investment in the city. In addition, information must be developed to provide a means of estimating the competing claims on these funds in order to determine the share that can be considered to be allocated to investment in space transitions. We shall draw upon the data that emerges from our study on private investors (Section B, 3) to develop the necessary estimating techniques.

Public policies of various sorts affect the availability of private investment funds. Such policies can, on the one hand, stimulate investment by eliminating certain barriers and, on the other hand, slow down investment. Many Federal programs, such as mortgage loan insurance, come into play and we anticipate that our study of private investors will throw light on this. Since these programs cannot be controlled within the city, we must find a way to forecast the effect of such programs on each type of transition in the future. Differential taxation of investment can also play an important part, and some way must be found to take such a policy into account in the model.

i. Development of a Method for Forecasting Non-Replacement Market Initiated Demolitions

Many structures are used long past the end of what might be ideally defined as their "economic life". They must all eventually be demolished, however, by one means or another. We have covered "replacement-demolitions" above (See 4, c). But there are other demolitions initiated by market forces which are accomplished simply because the structure is more expensive to keep up than to tear down, and for which no immediate re-use of the land is intended. We must also forecast these to complete the list of market initiated changes in the space stock.

Data for this forecast will be obtained from a study of past demolitions and the conditions under which they occurred.

5. Development of a Method for Forecasting Non-Market Initiated "Natural" Changes in the Stock of Space

As noted earlier, there are certain types of changes in the stock of space which are not brought about by, nor do they respond directly to, market pressures. In order for the model to complete its forecast of the state of the space use system at the end of each period, these other types of changes must be accounted for. They are crucial to the forecasting procedure for another reason: they will have significant effects on the private market-initiated changes in the following time-period. Thus, the effects of these changes are related to the private market's functioning, even though they are separated in the operation of the model during any single time period.

Basically, these types of changes fall into two groups: the first, discussed here, includes changes in space brought about by "natural" causes; the second relates to changes in space brought about through direct public actions.

Natural changes in space involve two types: (1) deterioration and aging of structures; and (2) demolitions due to fires, storms, etc. The "natural" deterioration and aging of structures must be considered in

assessing the inventory, by condition, from one period to the next. Similarly, natural demolitions must be subtracted from the stock of one period to form an accurate basis for forecasting space pressures in the next. Some simple stochastic procedure may be useful here to forecast the extent, timing, and location of such events, and this possibility will be investigated. Approximations for such a procedure could be gained from an examination of past demolitions of this type.

6. Development of a Method(s) for Forecasting Changes in the Space-Use System Due to Direct Public Actions

The second type of non-market-initiated change in the stock of space, as noted above, is that which is brought about by direct public action. If the model proves feasible, our task, during Phase IV (Programming of Renewal Actions), will be to develop, in conjunction with city personnel, a range of alternative public actions and to assess the consequences of these actions, as forecasted by the model. The alternative public actions will be designed outside of the model and inserted into its framework during each period.

Our immediate task is to try to identify a list of feasible and desirable public actions and to develop a method(s) for forecasting their effects on the space-use system. The following are some of the more important public actions of concern to us in this study:

- (1) Construction of community facilities, utilities, streets and highways, transit lines, etc. (These types of actions, if undertaken at the end of one period, will necessitate a reclassification of space-types during the next period by changing neighborhood conditions, accessibility, and perhaps other characteristics of space-types.)
- (2) Construction of government buildings and other government function areas. (These actions affect the inventory of space during the next period by (a) taking certain types of private space off the market, (b) either enhancing or depressing the values of neighboring private space, and/or (c) diminishing the government space inventory.
- (3) Construction of public housing. (This action alters the supply of space without requiring private

investment and thus, has significant effects on both the nature of space pressures and private investment funds available.)

- (4) Land purchase and site improvements in renewal projects. (These actions increase the number of possible transitions in certain areas by lowering the overall costs of construction in these areas and also by generally lowering land costs.)
- (5) Relocation from renewal projects. (This action, or more precisely, a consequence of a renewal action, adds certain user-units to the stock of users already estimated to enter the city during the following period--that is, the forecast of N_1 user groups.)

Our major study of public policies, programs and actions is directly focused on the development of sufficient information to allow us to implement this part of the model.

B. BASIC STUDIES, FIELD SURVEYS AND DATA COLLECTION TASKS

In Section A of this memorandum, we described a series of research tasks designed to establish basic units and categories and to determine certain key relationships needed to make the preliminary Community Renewal Programming Model operable. The studies described in this section of the memorandum are those designed to supply essential information for the Section A research tasks as well as to provide valuable information, even if decision is made to abandon the model.

1. Space: Supply, Use, Development and Characteristics

Space (in the sense of land area within the City which houses or contains any human activity) is one of our most important concerns. We view the Community Renewal Program as a means of controlling, guiding and managing the supply of different kinds of space in the City. Therefore, space is the "commodity" which users, investors and builders, and public policies and programs "act upon;" the task of the model (or any alternative approach that may be finally adopted) is essentially to forecast changes in the City's stock of space.

In our initial study of urban space, the first task will be to concern ourselves with the various types and categories which make up the total stock. It will be necessary to develop meaningful categories of space according to such variables as use, size, condition, location, etc.

Once these categories have been established, we will undertake a thorough historical analysis of the City's space, and its uses, tracing the events which have occurred to change each type of space in the City in the past. We will be interested in the way each type of space has grown in relation to other types. We will seek to determine: 1) how fast space has outgrown its usefulness; 2) what types of space tend to replace other types; and 3) in what locations such changes have tended to occur.

One of the major functions of the study will be "inventorying." The study will attempt to provide a comprehensive inventory of the City's space by type, condition, etc. for various points in time. By means of the examination of individual types of buildings and inventory analyses of the total space supply, we hope to uncover important new ideas about changing relationships which have never before been completely understood. (To date, no comprehensive detailed time-series sets of space inventories for San Francisco have been constructed in comparable form.)

Another objective of this study will be to investigate construction practices and costs. The technology and materials which have been used to produce space in the Bay Area have changed dramatically in the past few decades. We will need to know not only how these changes have occurred in the past, but also how they may affect future construction of various types of space.

Among our considerations, we will try to assess the effect of overall building massing, arrangement and density on the volume and types of space that have been constructed. We will seek to determine the different ways in which space has been adapted to changing functions and the differences in costs that have resulted.

In an important way, renewal is related to the condition of structures. Consequently, we will wish to determine what is "standard" and what is "sub-standard" in terms of building condition. We will try to determine whether such terms are really useful in themselves, and if not, what classification principle should be used to organize our understanding of the usefulness and adequacy of various types of space in a more meaningful way.

We will be interested, as part of this study, and based where possible on historical experience, in devising ways to estimate for future periods the various ways in which space can be altered, e.g., construction on vacant land, construction after demolition of an old structure, rehabilitation of an existing building, conversion of parts of a building, maintenance improvements in structures and demolitions and deteriorations. Since each process operates on different principles, different criteria and conditions trigger each into action; and different costs and methods are involved. These must be fully understood for effective development of the model and, in general, for understanding the renewal process in the City.

2. Users: Their Needs, Resources and Changing Demands for Space

Since the Community Renewal Program is looked upon as a means of adapting the supply of different kinds of space in the City to the needs of the population, it is necessary to undertake a thorough study of various types of users of space, including residential and non-residential, in order to identify their needs, resources, and changing demands for space.

Initially, we will want to describe and classify users of space in such a way that all members that belong to the same group can be expected either to respond in a like fashion to changes in the available supplies of space, or will attempt to take the same actions relative to space, given any particular state of the stock. We will attempt to identify the key differentiating variables (such as income, family size, race, etc.) which will permit us to assign any user to similarly acting user groups.

Once these user groups have been identified, we will establish a basis for monitoring the numbers in each group, that is to say, forecasting changes in the composition and size of the user population. Many such changes occur because of changing employment opportunities or because of the availability of competing supplies of space located elsewhere in the Bay Area, to mention but two of the relevant causes. Accordingly, a study of the changes and growth in the economy and population of the Bay Area, and of San Francisco's likely share in these changes and growth, will be undertaken. The special

metropolitan space markets study (now under way) will also provide a basis for the continuing forecasts needed to monitor the user population.

The numbers of users by type will be enumerated for selected periods in the past and for various locations in the City. This information will enable us to reconstruct the impact of these groups on the sequence of physical changes in the supply of space that have occurred at similar periods in the past.

The demands for space of certain user types generate a quick response in the private real estate market, resulting in very quick adaptations of certain types of space to meet specific demands. For other classes of users, however, adaptations occur much more slowly and, in fact, may never occur, leaving such users with a choice between moving away from the City, or permanently occupying space that is ill-adapted to their needs. The principal factor differentiating the ways the market responds to these demands is the availability of user resources. Consequently, during this study, intensive examination will be made of the resource characteristics of users, including the shares allocated for the rental or purchase of space, the credit that each user type may command, and the institutional stimulæ and impediments which affect the flow of these resources (the latter is a primary focus of the study on Private Developers and Investors - see B-3 below).

Non-economic factors, such as racial discrimination, which may also create barriers to the adaptation of space to the needs of certain user groups, will also be investigated.

Users have space needs which are, in some respects, independent of either their resources or the operation of the private real estate market. Relatively few activities of users are carried on in ideal environments; there is usually some compromise in the types of space used by practically all users. Some activities, for example, involve operations that are highly sensitive to innovation and only the most adaptable types of space will satisfy an activity subject to rapid change. Other activities are carried on in a manner that has changed little over generations. The durability of space is quite uniform, involving in many cases commitments on the order of decades. The expectations of user groups with respect to specific space characteristics need identification. During this study, we plan to develop "normal" requirements of users. To do so, we will examine norms based upon trends in space usage, the application of known standards, and the choices made by user groups similar in every respect except resources.

Attempts of users to take the same actions relative to the supply of space sometimes produce highly specialized occupancy patterns. This is the situation where a single group of users will occupy a relatively small number of space types and will not seek to occupy any other type. In this study, we will want to identify the restricted range of alternatives (e.g., location) that users consider when applying their resources to the space market.

Finally, since it is fairly evident that residential and non-residential users are sufficiently different in their behavior with respect to space, separate studies of these different user groups will be undertaken, along the lines described above.

3. Private Developers and Investors

Clearly, the preparation of an adequate Community Renewal Program requires an intimate knowledge of the complex and interrelated chains of cause and effect by which transformations in the City's stock of space occur. The Developers and Investors study will attempt to gain this necessary understanding of what economists might call the "supply" side of the market's functioning.

As a way of approaching this study, it will be most helpful to concentrate on the "actors" in the process of altering space and the way they make their "transformation decisions." Of first importance is the developer, defined here as the actor who initiates, or attempts to initiate, transformations. Developers in this sense include real estate syndicates, home owners, builders, corporations, and all other individuals and groups which actually initiate changes in space, as well as the conventionally thought of developer of subdivisions or apartment buildings. The decisions of the developer, as to whether or not to make a transformation on a given space unit and if so, of what type, when, and how, are really the core of the study.

We must first classify the various types of developers that operate in the San Francisco space market according to characteristics of their needs, expectations, management procedures, building processes, size, financial arrangements, etc. Relative to each class so established, we must trace out the particular paths of decision that they follow. We will seek to determine:

The factors that they consider in deciding whether or not to build, demolish, repair or rehabilitate a structure.

The working rules or criteria that they employ for evaluating these factors and deciding to act.

The methods they use to evaluate the costs and benefits of any contemplated construction activity.

The types of transformations that are within their potential span of activity.

The effect of various public policies (various codes, subsidies, restrictions, etc.) on their decisions.

The way in which these overall patterns of decision-making are likely to change in the future.

A second key actor in the process is the investor, defined here to include any individual, group or institution which invests in space (commercial banks, savings and loan associations, private religious groups, life insurance companies, private individuals, etc.). In any given transaction, the developer and the investor may or may not be the same. However, for our purposes, it will be helpful to assume that they most often will not be the same, and that the investor must make a separate decision to allocate funds, supposedly upon the request of the developer. Again, it will first be necessary to classify all possible investors according to their needs, functions, financial arrangements, and operating procedures. We will then seek to determine:

The way in which these decisions are made.

The factors that are considered and the criteria that are used by each type of investor in reaching his investment decision.

The way in which government programs (FHA mortgage insurance, monetary policy, etc.) affect investors' decisions.

It will be extremely important to gain sufficient understanding of current and past procedures and volumes of investment funds available, classified by type of source so that we can prepare forecasts of future levels. To do this, we will require a thorough study of the changing patterns of investment of all types, not merely investment in space. We recognize that there are many competing claims on the potential investment dollar and we must gain sufficient knowledge to forecast the future allocation of that share which is likely to go to space.

The Reconnaissance Program has revealed that some of the data for this study, both current and historical, is available from existing community sources, and from comparative studies of the real estate markets. However, information on investor's expectations and needs will be obtained by a special interview survey of investors and developers of all types, employing advanced survey techniques.

4. Public Policies, Programs, and Actions

One of the primary purposes of our overall study is to test the effect of various sets of public policies on renewal, and to select the set which is most likely to produce conditions which meet the goals of the City. One of the most crucial elements of the overall program, therefore, is the development of alternative sets of policies. Accordingly, we plan to carry out a study to:

a. Develop a complete listing of all public policies, programs, and actions which currently affect renewal or could potentially affect renewal, either directly or indirectly. These will include federal and state policies, as well as local policies; policies attempted in other cities, as well as those attempted in San Francisco; policies which are now only contemplated, as well as those which have actually been tried out. The listing will, for example, include such general classes of matters as:

- 1) Financing public actions. (City costs and revenues, budgetary and other fiscal procedures, bonding practice, etc.)
- 2) Organization and administration of public actions. (This aspect will be covered in most respects by the special Organization and Administration Study currently under way.)
- 3) Direct public construction. (Public facilities, utilities, streets and highways, transit, public buildings, public housing, etc.)
- 4) Legal restrictions. (Zoning, various codes, and the enforcements thereof.)
- 5) Renewal programs. (Land purchase, site improvement, related public facilities, relocation, etc.)
- 6) Policies altering private space costs. (Mortgage insurance, rent subsidies, legal restrictions on investment, tax and assessment policy, etc.)
- 7) Control and information functions. (Planning, research, coordination, etc.)

b. Relative to each specific type of policy, program, or action listed, we will attempt to develop the following information:

- 1) What is the history of this activity in San Francisco (if any)?
- 2) What were the objectives for which this activity was or would be established?
- 3) How was the policy designed or developed? (Standards, methods, etc.)

- 4) What results has the policy actually produced (intended and unintended) that affect renewal? (Costs, construction, land values, etc.)
- 5) Specifically, how does this policy affect renewal? What are the chains of cause and effect by which this policy changes the space market in a city?
- 6) What is the expected evolution of this policy in the future? How is it likely to change, and what changes in results can be expected?
- 7) What real cost does the institution of this policy imply for the City? (Social costs as well as monetary costs.)
- 8) What are the political implications of this policy? What local citizen reactions does it produce?

This study will be conducted by obtaining and analyzing information from the following sources:

- 1) Interviews with local government employees now responsible for programs, informed local citizens, policy specialists throughout the country, and other informed parties.
- 2) Published reports, records, accounts, etc.
- 3) Relevant data available in city agencies and sample field surveys.
- 4) Arthur D. Little, Inc., experience in the development of urban policy formulations affecting renewal.

U.C. BERKELEY LIBRARIES



C101694731